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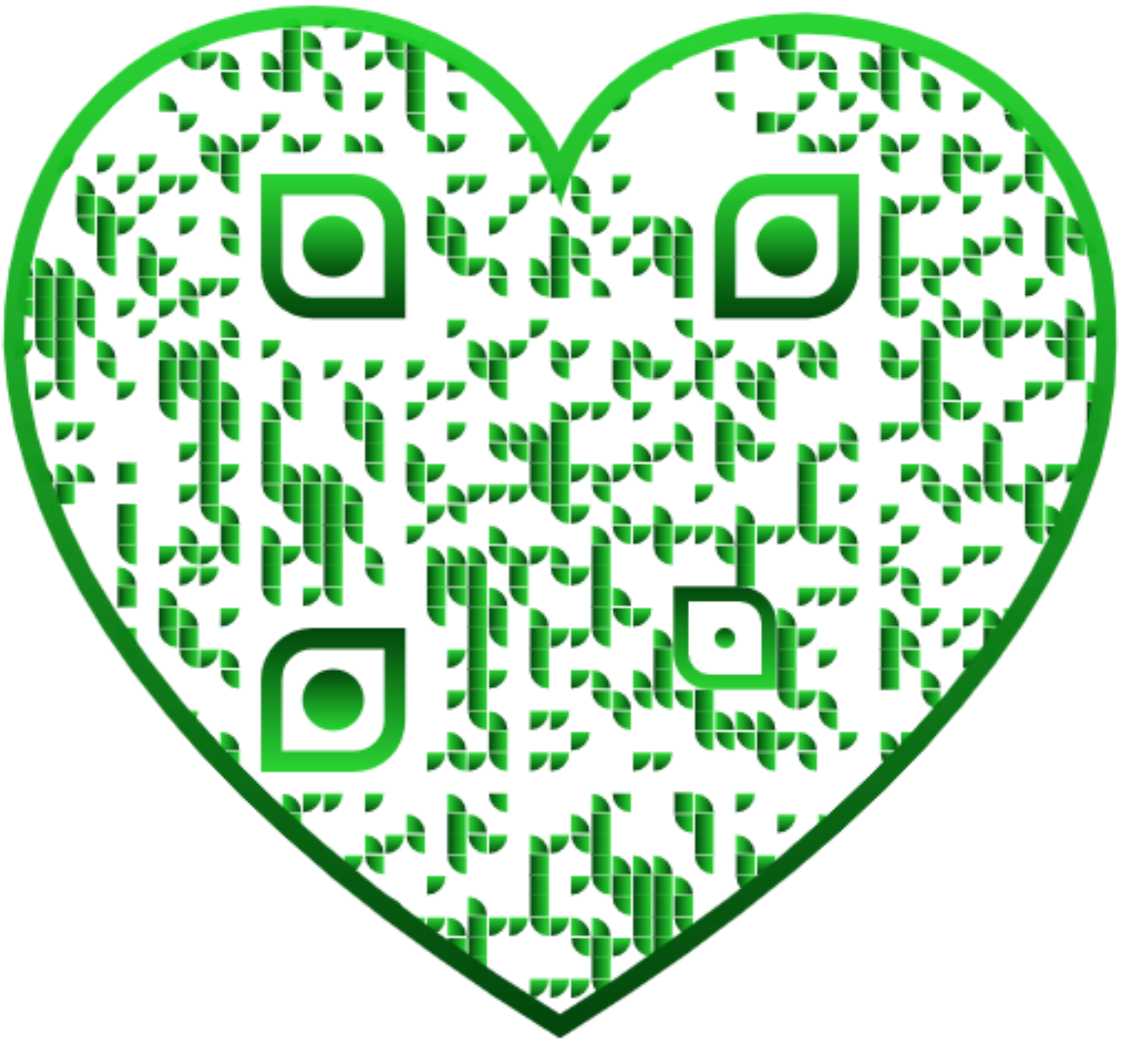

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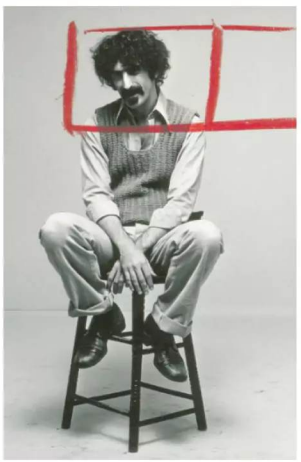
Our Top Picks for 2023 cover the gamut from amplifiers and speakers and headphones to TVs and projectors and soundbars. Whether you're into music, movies, games, or just everything AV, here's a collection of the top gear we reviewed last year.

On the Cover Clockwise from top: Bowers & Wilkins DB3D subwoofer, Bowers & Wilkins 703 S3 speaker, Teac UD-701N music player, Marantz AV10 processor, Optoma UHD35STx projector, Mark Levinson No. 5909 headphones.



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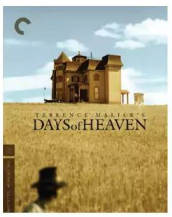

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The Big Picture

WHAT A difference a year makes. Just 12 months ago, I was thinking about UST projectors in the living room, but saw evidence that TVs would compete in the 100-inch size category. Now it's a year later, and 100-inch TVs are multiplying like rabbits while prices continue to drop. That's not to say that UST projectors haven't seen significant progress from new model releases, but what I find fascinating is how giant screen TV prices quickly became competitive with the cost of a UST projector.

Naturally, this resulted in a dimming of my enthusiasm for the UST category, reinforced by the real world experience of comparing a 98" TCL to various USTs. The fact is with projectors you always need to dim the lights to get a picture with perceived contrast that is somewhat equivalent to a TV.

Still, the real surprise of 2024 came from the projection category. It's the new breed of compact cube-shaped lifestyle projectors that utilize LED or laser light sources including triple-laser RGB for the ultimate in color rendition.

Examples of this fresh crop of projectors tend to forego the complex lens mechanisms used in dedicated home theater projectors, and they depend on DLP projection technology and achieve 4K with pixel-shift, as opposed to the specialized home theater models that are native 4K and use a variant of liquid crystal on silicon technology. The home theater projector do have higher contrast and greater flexibility in positioning, but at considerably higher cost. In this issue, you will find our projector buying guide that covers all three of these categories, and is based on hands-on experiences with all the included projectors.

Sounds Great

Looking back at last year's reviews, one experience stood out above all. It was tansitioning from a 9.4.4 speaker Arendal 1961 system—featuring nine tower speakers—and comparing the overall satisfaction with the listening experience to a 5.4 Bowers & Wilkins 700 Series S3 speaker system.

Of course, it's not possible to do an A-B comparison of the complete speaker systems, but the Bowers & Wilkins system review immediately followed the Arendal review, and my opinion is that the money is genuinely better spent on fewer, better speakers. This is, of course, just my opinion.

But what I found is that it all starts with that front stage. Superior left, right, and center channel speakers are going to have the greatest impact on the overall fidelity of a system. And adding a pair of surrounds that are able to keep up with that front stage is the key to creating enveloping surround sound. Yes, it's "just" five channels, but with quality speakers and proper setup, you get the benefit of a holographic soundstage and imaging, which is like having an infinite number of speakers surround you. As long as you are hearing clearly defined sounds floating through the air as opposed to bouncing from speaker to speaker, the illusion of immersion has been achieved.

When you are optimizing a system for a smaller seating area, such as a sofa in a living room, you can fine-tune a system with fewer speakers to really focus on that main listening position with hugely satisfying results.

IN THIS ISSUE

You'll find our 4K projector buying guide. Also check out our roundup of our highest-scoring Top Picks for 2023 where you'll see several products reviewed in this issue.

Mike Mettler dives into how The Moody Blues pioneered the orchestral rock genre with their groundbreaking masterpiece *Days of Future Passed*. This album, beloved by audiophiles, showcased their full commitment to the style. Also check out Chris Chiarella's review of Oppenheimer on Ultra HD Blu-ray.

I get hands-on with the Bowers and Wilkins 703 S3 Towers, assessing their sound quality and design. Also, the Bowers and Wilkins DB3D subwoofer—part of the same system—is examined for its ability to enhance audio depth.

The Sony HT-A5000 soundbar is considered by Tom Norton for its audio fidelity and surround sound features, while Optoma's UHD35STx projector is reviewed by Michael Hamilton for its image quality and applicability for both home cinema and gaming.

For 2-channel fans, Dan Kumin digs into a Teac UD-701N and AP-701 stereo system to evaluate audio performance. Barb Gonzalez takes a look at the Prime Wireless Pro SoundBase, focusing on its functionality as well as sound quality. I evaluate a Marantz AV10 and AMP10 system that's a true home theater powerhouse but also a beast for two-channel applications. And my review of the Samsung S90C QD-OLED TV focuses on visual clarity, color performance and features.—**MH**

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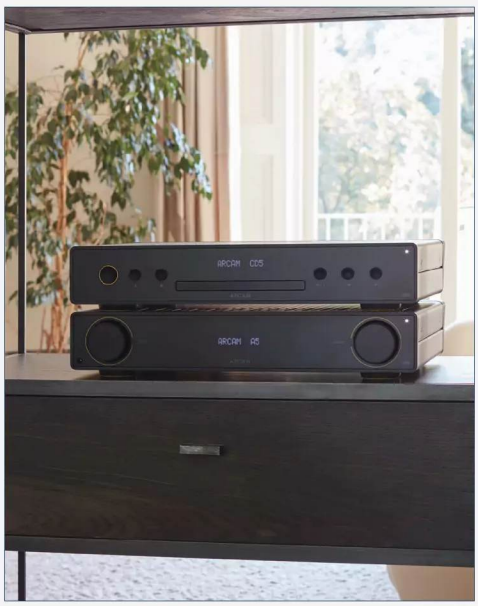

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Test Reports

In the next issue, we've got a fresh round of reviews lined up, covering the gamut from displays to speakers. In it, Tom Norton will tackle the Hisense U8K 4K TV while Michael Hamilton gets hands-on with the Hisense C1, an RGB triple-laser portable projector.

For speakers, Mark Henninger listens to the OSD Nero AB5 active monitor bookshelf speaker, which promises high fidelity in an affordable and compact package. Jim Wilson reviews Starke Sound's affordable and formidable SW15 15-inch sealed subwoofer. For electronics Dan Kumin evaluates the mighty Denon A1H AVR, a 15.4-channel behemoth packed with the latest in AV technology. Meanwhile Leslie Shapiro auditions Arcam's new A25 integrated amplifier and ST5 streamer as a Hi-Fi two-channel stereo system.

We'll also have Barb Gonzalez take the Victrola Hi-Res Carbon Turntable for a spin. Its outstanding feature is connecting directly to Bluetooth devices with aptX. As well, you'll get John Sciacca's Gen-X perspective on playing the Atari GameStation Pro retro Console.

Behind the Scenes

In his latest in-depth feature "The Creation of The Beatles' Last Song and the Rebirth of Red and Blue" Matt Hurwitz details The Beatles' final recording, "Now and Then" the release of which is complemented by a documentary and music video. The song, originating from a 1977 John Lennon demo, was completed decades later, employing innovative technology for sound separation.

Matt's article also explores the reissuing of the iconic "Red" and "Blue" albums, remixed in stereo with additional tracks, marking a significant moment in The Beatles' enduring legacy and influence in music history.

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EDITOR: **Mark Henninger**

SENIOR EDITOR, TECHNICAL EDITOR: **Tom Norton**
EDITOR AT LARGE, WEB EDITOR: **Bob Ankosko**
CONTRIBUTING TECHNICAL EDITORS: **Barb Gonzalez, Michael Hamilton, Daniel Kumin, Rob Sabin, John Sciacca, Leslie Shapiro, David Vaughn, Jim Wilson**
CONTRIBUTORS: **Michael Antonoff, Brandon A. DuHamel, Matt Hurwitz, Josef Krebs, Ken C. Pohlmann, Ralph Potts, Dennis Young**
MUSIC EDITOR: **Mike Mettler**
MOVIES EDITOR: **Chris Chiarella**

TECHNICAL CONSULTANT **Joel Silver, Imaging Science Foundation**

ART DIRECTOR **Jeremy Moyler**

WEB MONKEY **Jon Iverson**

AVTech Media Americas Inc
EDITORIAL DIRECTOR **Paul Miller**
FINANCE DIRECTOR **Owen Davies**

General Manager **Keith Pray**
kpray@avtechmediausa.com

Advertising Manager **Ed DiBenedetto**
edibenedetto@avtechmediausa.com

Sales Coordinator **Rosemarie Torcivia**
rtorcivia@avtechmediausa.com

Digital inquiries **Keith Pray**, kpray@avtechmediausa.com

Important Sound & Vision phone numbers and email addresses

USA subscriptions: Call (800) 264-9872, Canada & International (515) 244-0924
email SOVcustserv@cdsfulfillment.com, or write to
Sound & Vision, P. O. Box 37965, Boone, IA 50037-0965.
Please include name, address, and phone number on any inquiries.

Editor@soundandvision.com

Sound & Vision website www.soundandvision.com

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The F-Word Reconsidered

BY MICHAEL ANTONOFF

When a spokesperson for NextGenTV, the broadcasting standard also known as ATSC 3.0, appeared at a recent tech expo, he used the F-word frequently.

"Free is a very powerful term," he exclaimed. He then looked into the camera and spelled out F-R-E-E. "There's no better language than free. And the great thing about this is it's a free over-the-air service."

I heard the same pitch—coincidentally from the same dude—25 years earlier when he was doing public relations for RCA. It had launched a line of TV sets with a free, 2-day electronic program guide (EPG). Up until then, a subscription for the StarSight Telecast service available on certain competitors' TVs and VCRs would run you $46 a year. It was worth every nickel. Instead of fumbling for *TV Guide* Magazine or the listings section of a newspaper, an interactive grid appeared directly on your TV screen. You'd use the remote to highlight a title and get details for shows up to 14-days out. You'd use the EPG to change the channel or program your VCR with one press of a button. Purely informational, the EPG wasn't cluttered with advertising. It was point-of-need knowledge and control—everything a viewer required to stay comfortably ensconced on the couch.

In my review I dismissed the set as a degradation of screen real estate due to its Times Square-like amalgam of ad panels and banners, leaving little room to display guide information. A viewer might as well have been reading descriptions through a mail slot, requiring frequent scrolling to get anywhere. Since this was well before jumbo-size screens and the crisp text of high definition, users needed to work much harder during those analog years.

When that review appeared, the magazine's ad reps were livid. They claimed they had been so close to getting RCA to sign a frequent-page contract. "How could you ignore the fact that the guide was free?" they said to me, parroting the company's sales pitch.

I didn't want to come off as an elitist then OR in 2024 when maintaining *free* over-the-air TV is still a good thing despite the pervasiveness of broadband and 5G. Nevertheless, I also know that *free* really isn't free—past or present. As always, consumers need to factor in what they're giving up. Today, viewers are faced with a multitude of streaming services. Some are entirely commercially supported like Tubi and FreeVee. Others offer viewers a discount for allowing commercials into the program stream. These two-tiered services include Netflix, Hulu, Peacock and Paramount+.

I've been around long enough to remember when TV viewing was controlled entirely by the broadcaster. We were a captive audience for content and commercials alike. When the VCR came along, its record-first-and-fast-forward-later capability set that traditional relationship on its head. The DVR's quick skip button further strengthened the viewer's upper hand. In my review of an early DVR, I delighted in its ongoing gift to be able to "watch *60 Minutes* in 45."

Streaming has reversed the relationship, landing the content provider in the catbird seat once again. Except during live TV, I have not witnessed a commercial since the eighties. But now with advertiser-supported streaming services, seizing the remote can be an exercise in futility. You helplessly watch as a counter in the corner of the screen ticks down. One minute 30 seconds might elapse before the program begins again. You're trapped by an ad for Hyundai, another for B'EAU Collagen Water, then a promo for an upcoming show you've seen ad nauseum. Is this any way to count down your life?

Admittedly, the difference between seeing the same streaming service with commercials versus watching it ad-free is not insignificant. For example, Netflix's ad-supported plan costs $6.99 per month, while its ad-free plan is $15.49. Peacock supported by commercials is $5.99, but watching ad-free will cost an additional $6 a month. Paramount+ is $5.99 compared to $11.99. Hulu with ads is typically $7.99 per month versus $17.99 without them. For all these services, you can save money by paying a year upfront. Also, a service may run a limited-time promotion—especially if you're a former subscriber the company is trying to woo back. I succumbed to Hulu's Black Friday promotion. My plan does contain commercials, but it costs only 99 cents a month for a year.

To be sure, the commercial blocks in streaming aren't as onerous as those on cable TV, and the countdowns during streamed breaks let you better plan runs to the kitchen and bathroom. Still, once you realize that immortality is a myth, it's a no brainer that your time is more valuable than saving a few bucks by inviting more commercials into your home.

Read my lips: "It's Free!" So recites Dave Arland, NextGenTV spokesman, to Jennifer Jones, client rep for Pepcom Inc., a tech product expo.

The Author

Michael Antonoff is a freelance writer specializing in A/V technology and industry trends. He was senior editor for *Popular Science*, executive editor for *Video* magazine, technology editor for *S&V*, and a tech columnist for *USA Today*.

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wide angle Q&A

Wired and Wireless Audio Solutions

BY JOHN SCIACCA

Q I have Dali Euphonia MS5 speakers, each powered by Parasound Halo amps. I also have a center channel powered by a Classé amp. We're moving into a new house and would like to add surround sound speakers, as well as place Atmos modules to get Dolby Atmos.

Is it possible to combine wired and wireless speakers to achieve a 7-channel surround with Dolby Atmos using my existing speakers?

- DIVYESH PATEL

A Thanks for the question, Divyesh! There's a lot to take in here, and there are a few ways to make this happen, so let me break down your options and describe what it would take to accomplish this.

First off, I would always recommend going wired if at all possible. A wired connection is more reliable and gives you far more flexibility in selecting your amplification and speaker options. From the gear you mentioned, it's clear you have a high-performing rig, so going wired would let you better match the existing performance. Before you rule it out, I'd at least have a custom installer come by and see if a retrofit is possible...

Barring that, let's talk about going wireless. As much information as you provided, you didn't tell me what receiver or processor you are using...or maybe you're planning on getting a new one? If you're happy with your current AVR/pre-pro, then there are a few options for using it with a wireless kit to beam sound to the back of the room. If your receiver has pre-outs for the surround channels, I'd suggest using Atlantic Technology's WA-5030. If it doesn't have pre-outs, then I'd use the OSD Nero WRSKII which can accept speaker level connections. Either of these devices will transmit signals wirelessly to a receiver that will power traditional, passive speakers. The receiver connects to power, and you run traditional speaker wire from the amplified receiver to your speakers. However, both have fairly small amplifiers (30 and 25-watts/channel respectively), so it is certainly not a match for your current gear.

A step-up option would be to use either the Atlantic Technology WA-60 or Sonance MS Wireless Kit. These devices use the pre-outs on the receiver to send a line-level signal to the back of the room where you would connect any amplifier you like which would then drive the speakers.

Think of it as an invisible patch cord going from the front of the room to the back.

Now, if you need to get a new receiver, you could look at one of the models from Sony's AZ line or Yamaha's MusicCast AV receivers, either of which would allow you to wirelessly connect to some of their wireless rear speakers.

In the case of Sony, the SA-RS5 will do both surround and Atmos rear height processing. Of course, to work with your existing amplifiers, you'd want to select a model that has pre-outs for the front and center speakers.

Q I have a 7.1 system with an Integra receiver, and I use a cable box for my TV. However, when I switch to the Netflix app on my Sony TV, the receiver doesn't seem to switch to ARC; it stays on HDMI, and I only get TV sound instead of Netflix sound. Sometimes, powering down everything works to restore the connection, but the issue soon returns. Any thoughts on this? Thank you. **- Larry Hochstetler**

A We seem to get a lot of questions about TV audio and ARC (Audio Return Channel) via HDMI, so it's *definitely* worth revisiting here!

ARC was introduced in 2009 as part of the HDMI 1.4 standard, allowing for two-way flow of audio and video signals over a single HDMI cable. Since ARC was designed to replace the S/PDIF digital audio outputs of the day, it is limited to handling the same compressed audio formats as S/PDIF, namely Dolby Digital, DTS, and PCM audio up to 5.1 channels. (ARC did increase bandwidth up to 1 Mbits/second versus S/PDIF's 384 Kbits/second.) However, for all intents and purposes, the audio output from an HDMI ARC connection and a Toslink optical audio connection will be identical.

When HDMI 2.1 arrived in 2018, it introduced eARC (enhanced Audio Return Channel). This not only increased the maximum audio bandwidth to 37 Mbits/second, it also included support for next-gen, lossless audio formats like Dolby Atmos and DTS:X in resolutions up to 192/24, making it far superior to both ARC and Toslink connections. Beyond the improved audio, I've found that eARC is also far more reliable when it comes to switching inputs and controlling volume on a connected AVR or soundbar. When available, that is the preferred audio connection.

Since you didn't mention eARC, or give the model of your TV or receiver, I'll assume that isn't an option for your install. In my experience, the ARC connection between components was always quite buggy, not switching inputs or automatically engaging as you mention, and my company almost always uses the TV's Toslink connection versus ARC as it is just *way* more reliable and delivers the same performance. To cut down on input switching, you could connect your cable box directly to your TV via HDMI, and then keep your receiver on the TV Audio input (configured to use the optical audio input).

letters

The Big Picture

I am a long-term subscriber. Most of the past 30 years (there was probably a gap of a few years somewhere). I think I subscribed to *Vision* when the magazines were merged.

The December 23/January 24 magazine has a lot of sound equipment but very little on vision. One review of an OLED Sony. I wanted you to know that I barely look at the audio equipment reviews but read most of the TV reviews. This issue was sorely lacking.

I almost never look to update my sound systems. In my TV room I have a 1999 M&K system where we had to put a damper under the subwoofer (saw the damper in your magazine) to keep our windows from vibrating. I have a three-year-old Yamaha receiver that replaced a wonderful 20-year-old Yamaha receiver.

At the same time, I replaced the mid-80s Pioneer receiver in my family room with another Yamaha. I upgraded both receivers so I could network the room through MusicCast. In my family room I have a 1980s Bose satellite speaker system along with a pair of Yamaha WX30 speakers. I am very happy with these speakers. When we moved in 1999, I gave my late 70s JBLs to my son because my family room did not have space for them.

In the same 25 years our TV has gone from rear projector (45 inches?) to a 57-inch HD rear projector to a Mitsubishi 73-inch DLP to a 75-inch 4K Sony that is now about four years old. I am now counting on your magazine to someday review all the options at 98 to 120 inches under $10,000 with a focus on under $5,000. The current TVs from TCL, Samsung, and Sony along with UST projector with a 120-inch retractable screen that could roll down to cover our front window.

Please consider that your readers probably upgrade the TV much more often than they do with audio equipment.

Thanks,

Howie Ditkof

Thank you for your long-standing subscription and for sharing your thoughts with us. We value feedback from dedicated readers like yourself.

Your perspective regarding the balance between audio and visual equipment upgrades is insightful and is consistent with what I have observed anecdotally.

Like many of our readers, you have a keen interest in the latest developments in display technology. This is a dynamic field with rapid advancements. It's hard to believe LG OLED has only been with us for 10 years, and how recently 65-inch TVs seemed huge. We're glad to know that our magazine has been a part of your journey.

The suggestion to focus more on TV reviews, particularly in the 98 to 120-inch category with different price points, is well taken. There is a challenge, which is that these giant TVs will not be delivered to reviewer's homes. I can ask, but I already know the logistics will require a different approach to covering these beheoths. USTs are a bit easier in terms of delivery and setup and the potential to get a review unit is therefore a lot higher

However, we anticipate opportunities to get hands-on with these monster TVs. Certainly at shows like CES and CEDIA, although what you can do in that environment is very limited. Still, I expect to have some sort of hands-on time with the big screens by traveling to them.

It may be necessary to evolve how we cover TVs in order to accomodate this new trend and the logistics of dealing with giant screens. Still, make no mistake, it is very exciting that such TVs exist, and we want to ride that wave. The impact of screen size on movies is a defining element of the cinematic viewing experience.

By the time you read this, I should have just gotten back from CES 2024 with reports of what's happening in both those categories, as well as the new breed of laser light source long-throw lifestyle projectors like the XGIMI Horizon Ultra and Hisense C1. It's not just TVs that are seeing big gains in screen size and capability. The newest projectors offer the tantalizing potential of enjoying 150" and larger screens anywhere one will fit.

Your point about readers likely upgrading their TV more often than their audio equipment seems correct. TV prices keep dropping and defying inflation, plus the annual product refresh cycle, both help to sustain that phenomenon.

However, there is a lot going on in the world of audio, too. We've now also had Atmos for a decade. At first it was a big investment to implement. Now there's more and more lifestyle-friendly soundbar and wireless speaker solutions that support full immersive 3D sound.

The main thing is that interest in AV technology remains strong. That's why figuring out what to highlight among the vast selection of products is part of the challenge.

We're as excited as you are to see what comes next in the world of reasonably priced giant-screen displays. ● **MARK HENNINGER**

wide angle

immersive audio file

Big Atmos Generator

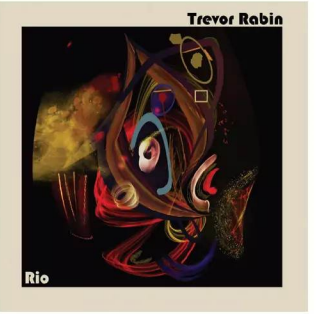
Guitarist/vocalist Trevor Rabin gives a rousing "yes" to doing surround sound and Atmos mixes for his solo work, movie soundtracks, and the albums he did with Yes in the 1980s and 1990s.

BY MIKE METTLER

Trevor Rabin is all in on leaping directly into the Atmos-mixing universe, having immersed himself in composing in surround sound for the 50 or so films he's scored over the past three-plus decades—plus the DTS-HD Master Audio 5.1 mix he supervised for the 2LP/1BD limited edition box set and companion 1CD/1BD version of his new solo album, *Rio* (InsideOut Music). In a recent Zoom interview, Rabin—the onetime Yes guitarist/vocalist/composer behind the somewhat unexpected No. 1 hit single from November 1983's *90125*, "Owner of a Lonely Heart"—and I discussed the creative surround arc of *Rio*, which soundtrack work of his should be released in surround, and what songs from his era of Yes would benefit the most from new Atmos mixes. (A longer version of this interview appears in my monthly Spatial Audio File column on the *S&V* site.)

Mike Mettler: Before we get into your thoughts about mixing any part of the Yes canon you were involved with in Armos, I'm curious to hear what you think about your 5,1-oriented soundtrack work as a creator and a composer.

Trevor Rabin: Since I left the band [Yes] in '94. I've practically only been working in 5.1—and, on occasion, 7.2—and it's an extremely different way of mixing, obviously. A lot of time, what people do is—well, the easiest thing to do is to just take a record and kind of "cheat" it in the surround remixing. It's not really "real," because all they do is put part of it out of phase, out to the back [channels]. For a film score, very few times would I put instruments anywhere other than between the front, and I'd throw the reverb in the back—not *completely* at the back, but halfway between the back. What I like about real surround sound is when you *really* use the instruments in the right way.



Mettler: Considering all the material you've composed for film over the past 30 years, you could probably compile a great surround release for some of that work.

Rabin: Definitely. The best surround sound mixes I did for movies—and, unfortunately, they're not on record—are for [2005's] *The Great Raid* and [2006's] *Flyboys*. Usually, I would mock scores up with samples of orchestra, but for *Flyboys* and *The Great Raid*, I didn't want the shackles of, if you're doing a string part that went [mouths the movement for a few bars], you'd need three samples—so you've got to have three tracks. Well, there *was* a little bit of synth stuff too, here and there. (chuckles) When I was doing that music in 5.1, the orchestra was done all at once, and it really just sounds *real*.

Mettler: Okay, back to Yes. Can we get you to do *90125* in surround or Atmos at some point? How great would it be to hear that intro to "Changes" in a full-channel fade-in, for starters?

Rabin: Oh, absolutely! It's kind of sweeping, in a tiny way, done through a compressor, squashing it to hell. Then it could be coming from the back and hitting it up so it comes from the right back speaker from nothing. And then it's in huge reverb into the front left speaker, dry as a bone. Yeah, I like that idea.

Mettler: See, you've already got the perfect mix for it in mind already. I don't think I can hear it any other way now.

Rabin: Yeah, that's going to be fun. I think I might just write a letter to whoever I need to (chuckles), because I'd *love* to do that. I think you've just literally implemented more work for me, because I *am* going to call on it.

I feel bad that I haven't actually done that mix yet, because sometimes the artist just gets bypassed when those things come up when catalog deals are made. There was a recent deal I went along with where I said, "Yes, I'll go along with this whole thing once you've worked everything out, but on one condition—you get me the masters so that I can bake them and transfer them." And I'm still waiting. I'm still waiting.

Mettler: Yeah, "I Am Waiting," to borrow a title.

Rabin: (laughs) Yes! ["I Am Waiting" is Track 2 on Yes' March 1994 Rabin-produced studio album, *Talk*.]

Mettler: Seriously, though, I'd love to hear the Rabin 5.1 and/or Atmos mixes of that other prime '80s and '90s Yes material of yours from [September 1987's] *Big Generator*—and even [April 1991's] *Union* and *Talk* too, for that matter.

Rabin: I do think it's a great idea. I mean, things like "Shoot High Aim Low" [from *Big Generator*] and the chorus to "Lift Me Up" [from *Union*] with, (sings) "and turn me ohh-over." Things like that would be great in surround—like, *where* you throw the reverb, and *how* you throw it. Right now, I've got a *lot* of great 5.1 reverb allocations, as far as plates and stuff like that goes.

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Outdoor Entertaining

PART 3

CREATING A MOVIE OASIS IN YOUR BACKYARD

BY JOHN SCIACCA

In my previous two columns I discussed how to improve your outdoor entertainment systems. Whether you want to upgrade your audio ("Creating an Audio Oasis") or your video ("Creating a Video Oasis"), there are tons of solutions at varying price points that will make sure your outdoor oasis is ready to party well past sundown!

But let's say you want something bigger than an 85-inch display, or are looking for a true outdoor theater experience? That takes a bit more doing, and is what I'll cover in this column.

BIG SPENDERS

The ultimate in outdoor video entertainment would be a MicroLED display. These are fantastically bright, have vibrant color, and come in a variety of sizes up to 200-inches. There is probably no greater expression of this technology than the models produced by C SEED, which are functional sculptures designed for the outdoors (and luxury yachts!) that almost magically rise from the ground and unfold into beautiful, cinema-sized displays. (Visit www.cseed.com to see the system in action.) Of course, with the "cheap" models selling for nearly $200-grand, these aren't for everyone. But, to quote Ferris Bueller, "It is so choice. If you have the means, I highly recommend picking one up."

For the rest of us, getting a big screen experience outside will be the same as it is inside, which will be via a projector.

SETTING EXPECTATIONS

As you likely know, a projector cannot actually project "black." Instead, they just project "nothing" where black should be and the actual black level on screen is determined not only by the projector's limitations, but even more so by how dark the room/environment is. And one of the biggest issues with using a projector outside is that it is almost impossible to get the light level even close to black – and you can all but forget about using it before sunset. Between star/moonlight, street lights, neighbors' lights, cars driving by, etc. you have to remember that the outdoors is never going to be a reference environment and that watching outdoors is more about having fun.

TEMPORARY VS. PERMANENT INSTALLS

Say you're looking to just have an occasional outdoor theater; something you pull out for special occasions or events. You could really use any projector for this, but generally the more lumens (light output/brighter) the better. Using one of the portable projectors offered by Xgimi, HiSense, LG, and Samsung is another great solution. These are small enough to tote in and out with ease (we take ours on trips), and generally have Wi-Fi and streaming built-in or allow Casting or AirPlaying to them. And they typically have a lot of adjustments for correcting the image geometry on the screen.

If you expect to use it regularly, and don't want to tote something in-and-out, a permanent projector install will require a weather protecting projector, something like a DeerTV outdoor projector enclosure. You could also install the projector inside a conditioned space, and have it fire through a piece of glass.

Along with a projector, you'll need a relatively flat/smooth surface to project on, and there are a variety of quick, easy, and cheap solutions here. We've watched movies on the side of a white wall, up on the ceiling, and on our garage door; not perfect, but certainly enough to entertain a group. You could also hang up a sheet, or purchase a portable screen that sits on a tripod.

Of course, if you're going to be watching outdoors on-the-regular, you'll want to invest in a better screen that is also designed to live outside. Two great options are Elite Screens Yard Master and Screen Innovations Solo 3 Outdoor. Both have materials designed to withstand the elements, offer a variety of power options including battery and solar, and you can't get more cinematic than the Solo 3 available in widths up to 16-feet!

AUDIO AND VIDEO

While some projectors have built-in speakers, this definitely won't cut it for entertaining a group outside. But, tying the audio and video together can be a trick.

With a temporary install, you could pair the projector to a Bluetooth speaker, or run an audio cable to a soundbar. But achieving a more cinematic experience will require a bit more work, as any permanent audio system will likely live inside the house while the projector is outside.

You can definitely employ the same suggestions from my outdoor audio column, unless you are looking for a true, theater/surround experience, which requires correct speaker layout and positioning. Of course, to make sure bass is covered, look to add landscape subwoofers in either hardscape or in-ground formfactors.

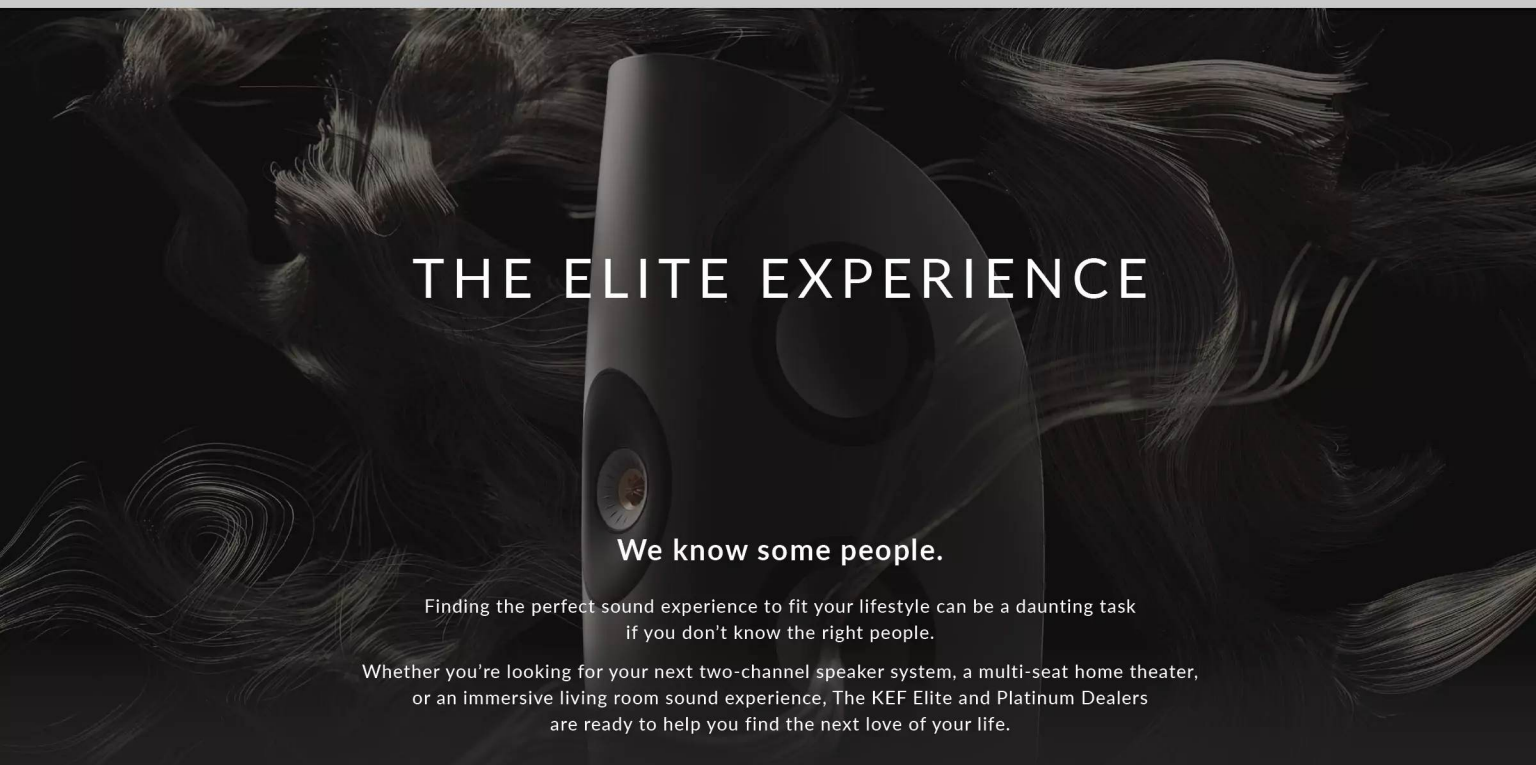
Since there will likely be some distance between the audio and video systems, sending the signals between them will require some special cabling. There are fiber optic HDMI cables available in lengths up to 200-feet, or you could use an HDMI extender kit that sends signals up to 330-feet over Category-rated cabling.

You'll also want to be able to control the audio system, so you can adjust volume and operate any sources, but this can easily be done with a universal remote control that uses radio frequency such as many of the URC models.

The Author

Since 1998, John Sciacca has worked as a custom installer in South Carolina. In his free time, he enjoys drinking craft beer, playing pickleball, and watching movies on his 7.2.6 surround system.

KEF Listen and believe



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They are Coming. I Can't Hold Them Back Any Longer.

BY KEN C. POHLMANN

This is my last communication. Outer walls breached. Door is splintering. Hinges giving way. Out of ammo. Just one grenade left. I'll take as many as I can with me. God have mercy on my soul.

This holiday season was another last hurrah. One of the last bastions, Best Buy has been a stalwart brick-and-mortar retailer of audio/video gear and movies. But with the new year, its inventory of silvery discs will disappear. Starting in 2024, Best Buy will no longer sell DVD or Blu-ray discs in-store, or online.

Apparently, getting out of the disc business is a financially prudent thing to do. The once ubiquitous racks of discs are fast disappearing from the electronics departments of both big-box and small-box stores. Yes, some grocery stores have tubs 'o movies, but that's just sad. The reality is that the retail movie floor space is giving way to something presumably far more profitable, like iPhone cases or screen protectors, or something. Also very sad.

Much like a zombie apocalypse, sawed-off Remington in hand, we can fight bravely, but the final chapter seems like it's only a matter of time. The onslaught directed at us, of course, is a veritable torrent of ones and zeroes, as unstoppable as a mother's love and as inevitable as death and taxes. Bit by bit, word by word, physical media is being relentlessly replaced by streaming.

Once upon a time, if you lived in an urban area, you might have shopped at a Virgin Records store. Or, even better, maybe you wandered over to your local mom and pop record shop. Flipping through bins, music and movies, treasure-hunting, finding that special disc, the thrill of discovery. The uber-cool and knowledgeable cashier nods approvingly at your selection, you take possession, the sense of anticipation, impatience. Back home, that satisfyingly sagging shelf, titles alphabetically aligned. Unique, personal, a sense of identity and accomplishment – your disc collection. Drop the needle, load the tray, sit back. Everything is right with the world.

Many years ago, along with many others, I predicted the advent of the "Celestial Jukebox," an online depository of movies and music, all available at the touch of a button. It all seemed so wonderful. Now, a few finger swipes, more smudges on the screen, tap, play. Lawrence of Arabia on 15 square inches and the free earbuds you got on your last flight. Hmm, everything is not right with the world.

Of course, there is no turning back. One after another, the zombie horde is overrunning the retailers. The loss of Best Buy is a major blow. But Walmart, that impregnable brick and mortar fortress of retail might, probably accounting for half of the entire remaining DVD/Blu-ray market, will continue to sell the silvery tokens, and Amazon is still fulfilling online. At least for now.

And the silver discs have their defenders. As filmmaker Christopher Nolan recently noted, "In the case of 'Oppenheimer,' we put a lot of care and attention into the Blu-ray...a version you can buy and own at home and put on a shelf so no evil streaming service can come steal it from you." The implication being, of course, that your favorite online movie might be there one day, then gone the next. With a disc, you can own the movie in perpetuity. Well and good, but ultimately Nolan's defensive line will be breached. One day, Hollywood studios will decide that they will no longer release their blockbusters on disc.

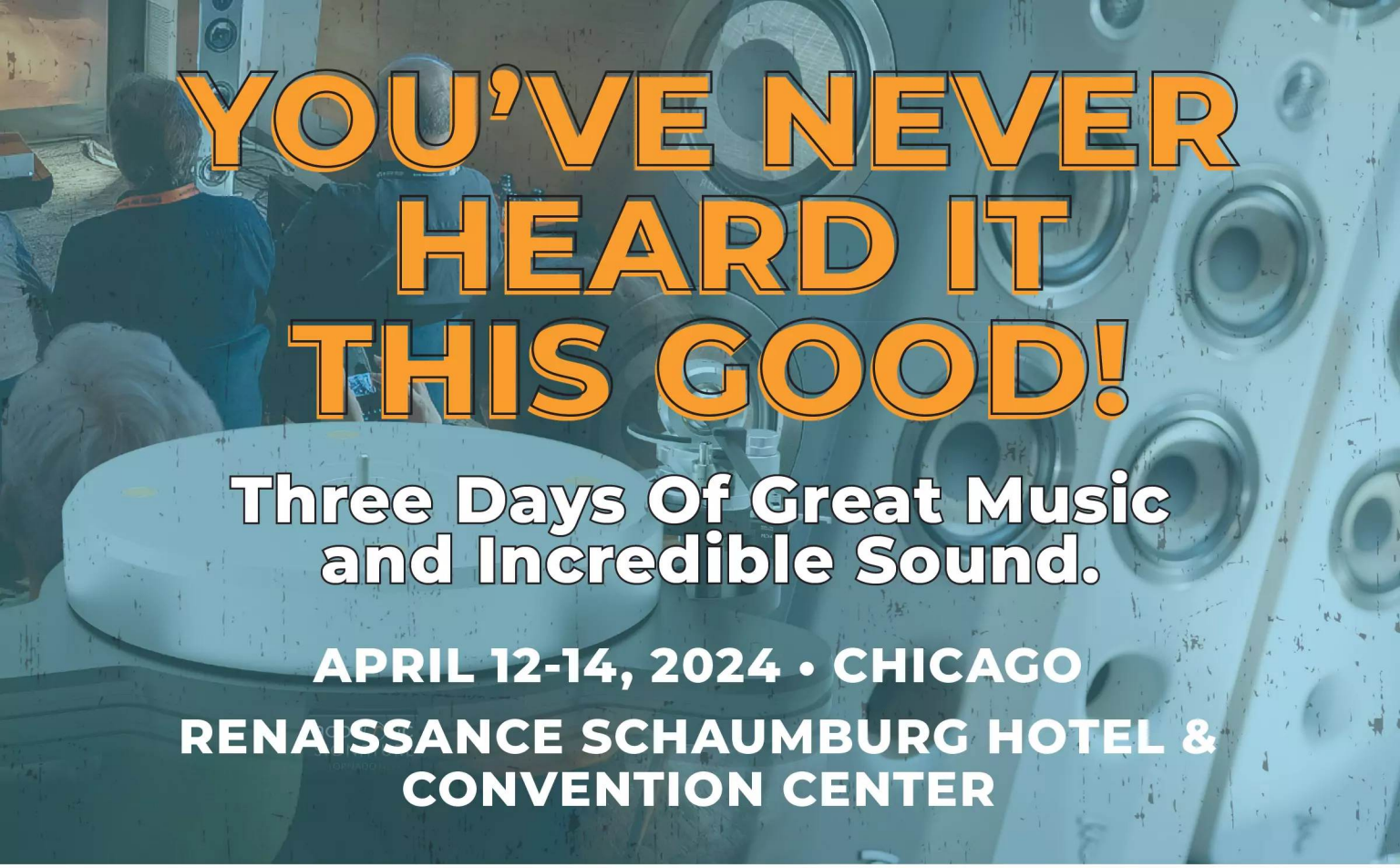
Interestingly, vinyl music, ornery analog critter that it is, is metaphysically immune to streaming. If it streams, it's digital. And that would negate the whole purpose of analog audio. CD, DVD and Blu-ray, on the other hand, digital kissing cousins to streaming, are easily subsumed by the torrent. Aside from a broken plastic case, for the typical consumer, there is little to differentiate a disc from a stream except for the fact that the stream seems much, much better. As a wise man once said, bits are bits. To point out the uniqueness of analog, I would add, waveforms are not bits. Amid the binary carnage, fortress analog soldiers on.

Of course, while the typical consumer might not care, and indeed welcomes the convenience of streaming, 'philes are rightfully distressed. Once again, the battle of convenience versus quality must be fought. And 'philes know how that battle always ends. It ends in a chat room in some very sub, subforum of aficionados and diehards with a late-night discussion of exactly when we reached, then pulled back from, the high-water mark. Eventually, the discussion devolves into an argument over whether that Japanese store that still sells "the good stuff" is real, or only a myth. In that very cold place, we vainly try to warm ourselves over a neatly wired complication of 12AX7s, glowing ruddy red in the darkness.

I have fought bravely, even heroically. But it's only a matter of time before they win. The day will come when I am barricaded in my home theater, squeezed in among the shelves of physical media from the begone days. The streamers pounding mercilessly at my door, I take one last disc from its case, blow gently across its silvery surface, then sigh as the door gives way and they throw themselves upon me.

The Author

Ken C. Pohlmann is an electrical engineer specializing in audio topics as a consultant and writer. He is Professor Emeritus at the University of Miami.



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SHARP, BRIGHT, & BUDGET-FRIENDLY

By Mark Henninger

IN JUST a few short years the home projector landscape has undergone a radical revolution in terms of price and selection. There's the proliferation of UST (ultra-short-throw) DLP projectors with laser light sources over the past few years. Even more recently, a new breed of compact and powerful "lifestyle" standard-throw models has emerged. These projectors produce bright and sharp images, often with a level of video fidelity previously unimaginable at their price point.

Meanwhile, the dedicated home theater projectors from industry stalwarts like Epson, JVC, and Sony have transitioned to laser light sources.

A key point to emphasize is that this buyer's guide is based directly on my hands-on experience with all the included models. It is not a list that's just based on specs. Also for the purpose of this roundup we're staying away from five-figure price tags (or higher). Otherwise, we'd simply suggest you go buy a Christie Eclipse and be done with it!

Dedicated Home Theaters versus Living Areas

A 4K dedicated home theater projector typically starts at around $5,000 and can run into the six figures for high-end installations. These projectors are generally much larger than the lifestyle models and do not usually offer more brightness than the other projectors featured in this list. Instead, they focus on delivering superior contrast, a feature best leveraged in a completely light-controlled environment such as a dedicated home theater with dark walls and ceiling. Home theater projectors often include sophisticated optics with powered focus, zoom, and lens shift capabilities. These heavy-hitters also typically have sophisticated processing for dealing with HDR, JVC consistently earns plaudits for how well

its projectors handle the crucial task of tonemapping content mastered at 1,000 nits for a setup that might be topping out at 100 or 150 nits. It costs a lot to buy a third-party video processor such as a MadVR that can match what JVC does right out of the box.

The rest of this list comprises projectors suitable for more versatile and varied environments, such as living rooms, basement hangouts, or backyard cinemas. However, even home theater enthusiasts will find appealing qualities in some of the Ultra-Short-Throw (UST) projectors and laser/LED lifestyle projectors. These models stand out for their high brightness relative to their size and cost.

Something to keep in mind when shopping for any projector is the combination of viewing environment and content type. The darker the theater the more black levels come into play when it comes to creating contrast. But in a living room with a lot of ambient light, it is brightness that plays the key role in perceived image quality.

It is practically axiomatic that a movie lover will appreciate a projector that does well in a dark space. But the flip side is that a sports lover will appreciate a projector that produces an image that holds up on a Sunday afternoon in a white-walled living room with only curtains or shades blocking the Sun.

Native 4K vs. Pixel-Shift

Of all the projectors on this list, only the dedicated home theater models are native 4K. The others employ pixel-shift technology to display more pixels on the screen than the imager possesses. This is achieved by rapidly shifting the position of the imaging chip, either between two points (2X) or four points (4X) pixel-shifting. Technically, 4X pixel-shifting can project an image with 4K resolution although the pixels themselves do overlap, so it is not possible to reproduce a 1-pixel checkerboard pattern. Nevertheless pixel-shift has proven effective at increasing resolution while simultaneously mitigating the "screen door effect" seen with native 1080p imagers.

Interestingly, the impact of a lens is such that a DLP projector with 4X pixel-shifting and a truly sharp lens can resolve detail as well as, or perhaps even better than, a native 4K home theater projector. This means that for a dedicated home theater projector to fully render 4K detail, it needs a high-grade lens, which often comes with a significant cost if it is to feature zoom and shift capabilities.

LED and Laser Longevity

The common thread among these projectors is their use of solid-state light sources, eliminating the need for traditional bulbs. The difference in lifespan is dramatic, going from thousands of hours to tens of thousands. However, the type of light source used varies. Laser-phosphor models, which utilize a single color blue laser, often have a more limited color gamut compared to RGB triple-laser units. However, they are largely immune to creating visible laser speckle, a phenomenon seen in triple-lasers that can affect image clarity.

Other projectors used LEDs as a light source. LEDs offer high brightness and longevity but typically not as wide a color gamut as laser. Some projectors combine lasers and LEDs, a strategy that can offer a favorable balance between cost, color depth, brightness, and the reduction of laser speckle artifacts.

Artifacts?

Yes. Artifacts are an unfortunate reality in projector technology – there's always a trade-off. For example, triple-laser RGB projectors often exhibit laser speckles. These speckles resemble glowing grains or noise on the screen.

In the case of triple-laser Ultra-Short-Throw (UST) projectors, a common issue is convergence problems, leading to what appears to be chromatic aberration (CA). This manifests as a colored fringe – typically red and blue – surrounding a black line against a white background. However, these effects usually become less noticeable at the distances typical for normal viewing.

Another artifact specific to DLP (Digital Light Processing) projectors is the 'rainbow effect.' Although less prevalent than in older models, which used bulbs and color wheels, it can still be detected with careful observation. Unlike before, when the effect was continuously noticeable, it now requires active effort to spot it."

The thing to know is that different people have different tolerance thresholds for different artifacts. That's why projectors need to be judged based on the actual intended usage of the buyer. For example, when it comes to laser speckle, I find it's usually hard to spot with normal content at normal viewing distances and therefore its presence is a worthwhile trade-off for the rich saturated colors that you get with triple-laser RGB light sources. But as the saying goes, your mileage may vary.

Special Screens

Investing in a dedicated screen significantly enhances the projection experience. While a plain wall can suffice for temporary, portable setups, a quality screen maximizes a projector's performance.

UST projectors pair well with specialized lenticular ambient light-rejecting screens with strong ceiling light rejection. These screens are designed to improve contrast and effectively reduce the impact of light reflecting off the ceiling. This makes them suitable even in rooms with some ambient lighting. However, in a dark room dedicated to movie watching, a UST can also perform well with a standard white screen, especially when the ceiling is black to prevent reflections that can wash out the image.

A notable advantage of UST projectors is their proximity to the screen, which prevents people from walking in front and obstructing the view. The dedicated screens for USTs excel in rejecting side and ceiling light, enhancing image quality. But keep in mind, these screens can be pricey, and pairing a UST with a high-quality screen may cost as much as a 100-inch TV. And they only work properly with UST projectors, they will literally reject light coming from a long-throw projector.

The guide also features a new generation of compact, long-throw projectors. These projectors, boasting light engines similar to those in USTs, come in varieties like single-laser plus phosphor, triple-laser RGB, and hybrid-laser LED. They all deliver high light output, great longevity, and a wide color gamut which leverages that aspect of HDR.

What's interesting about these new compact long-throw projectors is their lenses: they are simple yet incredibly sharp. 'Simple' because they lack shift capabilities and have minimal or no optical zoom. That means placement options are limited unless you are willing to use digital zoom and keystone (fine for temporary installs, but for permanent placement it's best to disable such adjustments and work with physical placement. But, if you are willing to ceiling mount one of these models, then you can easily find the right distance that works with your chosen screen size.

But they also are very sharp and tend to have minimal or no chromatic aberration. The main point is with these simple lenses are a bit like photographic prime lenses. They are at once smaller and yet higher quality than a zoom. Their sharpness ensures they don't compromise on image quality. Despite these projectors using pixel-shifted 1080p DLP imagers, the end result compares favorably with USTs and competes with the larger native 4K home theater models. Impressively, these projectors can deliver excellent image quality even on a painted wall and offer surprisingly good accuracy right out of the box.

With prices typically under $2,000, these compact lifestyle 4K models rival premium 85" TVs in cost-efficiency, offering stunning visuals, particularly in darkened environments where the vivid colors of HDR come to live thanks to their very wide color gamut.

Best 4K Dedicated Home Theater Projectors

For movie lovers, there's nothing that can beat a dedicated home theater space and a projector designed to do its best work in a dark room with the lights out. Grab some popcorn because with these projectors, it's showtime!

JVC DLA-NZ7($9,000)

JVC is the go-to brand for home theater enthusiasts willing to put in the legwork to get the most cinematic result. And its DLA-NZ7 is an 8K e-shift (pixel-shift) model with native 4K three-chip D-ILA as the foundation. JVC has the secret sauce when it comes to HDR tone mapping. I've seen this projector doing its thing and it is the single best projector in this roundup for use in home theaters. How do I know? I've directly compared it to the Epson LS12000 and Sony XW5000ES and seen it pull ahead in every appreciable sense. Which, given the asking price, is what you'd hope it does. Clearly sharper, with more contrast and better HDR handling.

I know numerous picky home theater enthusiasts that have settled on this projector after considering all options. It is practically iconic.

JVC's DLA-NZ7, a favorite among home theater enthusiasts, stands out with its 8K e-shift technology built on a native 4K three-chip D-ILA system. Known for its exceptional HDR tone mapping, this projector delivers a top-notch cinematic experience. It combines 8K e-shift with Frame Adapt HDR Generation 2 for dynamic HDR10 content, and its 17-element all-glass lens ensures sharp 8K images. The projector's dynamic contrast ratio reaches infinity:1, and native contrast is 40,000:1, backed by a 0.69-inch 4K D-ILA device and dynamic light source control. Its BLU-Escent Laser Diode light source offers high brightness and a 20,000-hour lifespan.

The DLA-NZ7 supports HDR10, HDR10+, and HLG formats and features a 4K120p input with Low Latency Mode, suitable for gaming. It includes Filmmaker Mode™ for authentic movie experiences and various installation options. With 2200 lumens brightness, 12-bit color depth, and a 2x zoom lens, it provides versatile, high-quality projection. Additionally, it is 3D-capable and has HDMI ports that support up to 8K60P input. If you love movies and can afford one, this is the machine for you.

- **8K e-shift Technology:** Built on a native 4K three-chip D-ILA system, providing sharp 8K images.
- **Exceptional HDR Tone Mapping:** Integrates Frame Adapt HDR Generation 2 for dynamic HDR10 content, enhancing the cinematic experience.
- **High-Quality Lens and Contrast Ratios:** Features a 17-element all-glass lens, infinity:1 dynamic contrast ratio, and 40,000:1 native contrast.
- **Advanced Light Source and Device:** Utilizes a BLU-Escent Laser Diode light source with a 20,000-hour lifespan and a 0.69-inch 4K D-ILA device.
- **Comprehensive Format and Input Support:** Supports HDR10, HDR10+, HLG formats, and 4K120p input with Low Latency Mode for gaming, along with 3D capability and HDMI ports for up to 8K60P input.

Sony VPL-XW5000ES ($5,000)

Sony's VPL-XW5000ES is a native 4K home theater projector with a laser-phosphor light source. If you go searching, you'll find it is the least expensive projector that can make this boast. We reviewed this projector not so long ago and found it a worthy successor to the VPL-VW325ES, even if in order to maintain its price point it sacrifices ergonomics for performance.

The Sony stands out for its affordability and advanced features, including a laser-phosphor light source and a new 4K SXRD panel. Priced at $4,999, it offers a cost-effective solution for high-resolution projection needs. Its 20,000-hour laser light source ensures durability and fast operation. However, the projector's manual lens, smaller and with a shorter zoom than its predecessor, may restrict its use in some spaces and, despite careful adjustment, may not achieve perfect sharpness.

The Sony VPL-XW5000ES projector, lacking HDR10+ compatibility, uses HDR tone-mapping when aiming to accurately represent the creator's vision, although this is an area where JVC has an advantage. The projector is relatively appealing for gamers, offering a low input lag of 21 ms (or less) at 4K/60p.

For connections, it includes two HDMI inputs, an RJ45 LAN port, RS232C, IR input, and a 12-volt trigger. However, its lack of an RF 3D emitter output means it doesn't support 3D playback, which could disappoint enthusiasts of 3D content.

What we have seen time and again from this particular projector is that it offers

the bulk of the quality and capability of its pricier siblings at a fraction of the cost, so long as you can live with the indignity of manual lens adjustment.

■ **Affordable Native 4K Projection:** Priced at $4,999, offering a cost-effective solution for high-resolution, native 4K projection.
■ **Laser-Phosphor Light Source:** Equipped with a 20,000-hour laser light source for long-lasting, fast operation.
■ New 4K SXRD Panel: Features an advanced 4K SXRD panel with native 2160x3840 pixel resolution.
■ **Low Input Lag for Gaming:** Offers a low input lag of 21 ms (or less) at 4K/60p, making it appealing for gamers.
■ **Versatile Connectivity Options:** Includes two HDMI inputs, RJ45 LAN port, RS232C, IR input, and a 12-volt trigger, but lacks 3D capabilities.

Epson LS12000 ($5,000)

The Epson LS12000 is a pixel-shift 4K projector that sacrifices a bit of raw contrast performance—primarily black levels—relative to JVC and Sony but makes up for it with features. Most notably, it features a sophisticated lens with powered focus, zoom, and shift capabilities, as well as lens memory slots for different configurations. Long story short, this is a projector that you can program to work with a variable aspect ratio screen.

The LS12000 features advanced pixel shift technology to deliver 4K resolution (3840x2160) from three 1080p LCD chips. It offers up to 2,700 ANSI lumens of brightness from a solid-state laser light source, HDR10+ support, and less than 20 ms input lag for gaming. However, it lacks 3D capabilities and dynamic tone-mapping for HDR10.

Epson's new blue laser diode array creates an efficient white light source with low heat and consequently minimal fan noise. This light converts to the three primary colors for the projector's LCD panels, ensuring equal brightness and eliminating rainbow effect. The laser's lifespan reaches up to 20,000 hours.

The LS12000 uses the Epson VRX Cinema Lens, a 15-element structure for zero light leakage and uniform focus. Its 2.1x zoom and broad throw ratio range allow versatile placement, complemented by powered focus, zoom, and lens shift for easy setup. The projector dynamically adjusts contrast using a Dynamic Contrast laser dimming function but lacks an automatic iris.

For HDR content, it features a 16-point HDR Dynamic Range slider and Scene Adaptive Gamma, using the ZX processor for frame-by-frame enhancements. However, the absence of dynamic tone mapping may limit its performance. The LS12000 has two HDMI 2.1 inputs, supports 4K at 120 Hz, and offers calibration options, though it may slightly crush bright whites with HDR.

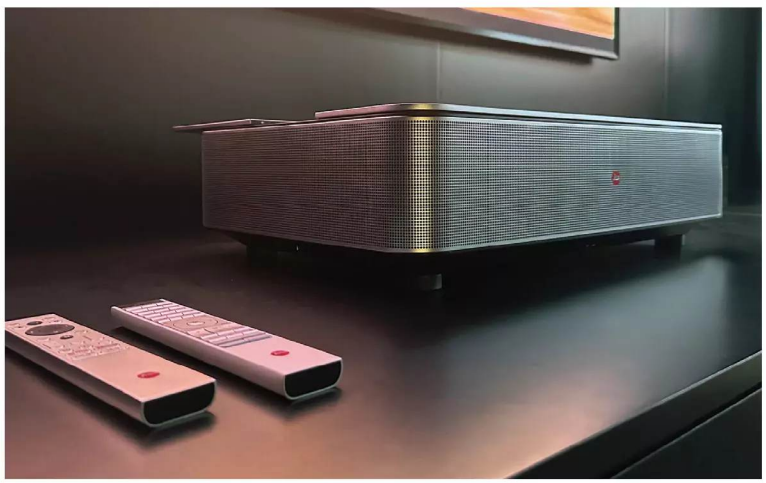
■ **Advanced Pixel Shift 4K Technology:** Delivers 4K resolution (3840x2160) using three 1080p LCD chips, providing high-quality image resolution.
■ **Solid-State Laser Light Source:** Features up to 2,700 ANSI lumens of brightness and a new blue laser diode array, offering efficient white light with low heat and minimal fan noise.
■ **Epson VRX Cinema Lens:** Utilizes a 15-element lens structure for zero light leakage and uniform focus, with powered focus, zoom, and lens shift for easy setup.
■ **Dynamic Contrast and HDR Support:** Includes a Dynamic Contrast laser dimming function and a 16-point HDR Dynamic Range slider, although it lacks dynamic tone mapping for HDR10.
■ **Connectivity and Gaming Support:** Offers two HDMI 2.1 inputs, supports 4K at 120 Hz, and provides less than 20 ms input lag for gaming, but lacks 3D capabilities.

UST Projectors

USTs come in many variations now. Some aim to please the cinephiles of the world. It is in the UST category where we have seen DLP native contrast ratios pushed beyond what was previously thought possible.

Other USTs are all about replicating that "giant TV in a sports bar" experience and deliver a lot of lumens for the money. Here are some of the best examples of this burgeoning projection category that has changed the game when it comes to what's considered a big screen these days.

Leica Cine 1 ($9,000/100" or $9,500/120")



The Leica Cine 1 is quite possibly the best general-purpose UST you can buy today, but you do pay a premium for the pleasure. It is an RGB triple-laser model manufactured by Hisense, and the Leica branding is not just for show, it represents an overall higher standard of quality. This projector features a fixed-focus lens crafted by Leica to deliver superior performance. It effectively minimizes RGB convergence and aberration issues commonly seen in other RGB triple-laser projectors, delivering a sharp image quality that rivals traditional long-throw native 4K projectors. The Leica is a polished product with highly accurate color right out of the box and properly functioning calibration controls to further tweak the image. I've seen it put through the paces and its sharpness is so outstanding it rivals long-throw native 4K projectors. The main issue with the Cine 1 is that despite qualifying for this list with an MSRP under $10K, it is still a "cost no object" purchase while the Hisense PX2-Pro is the much more affordable option. But I also think it really is the best overall UST for image quality, even if the other models here do certain things better; the lens sharpness is what gets me. I want to say that you get what you pay for with the Leica, but this might be a case where the law of diminishing returns needs to be factored into a purchase decision.

- **Fixed-Focus Leica Lens:** Crafted to minimize RGB convergence and aberration, ensuring sharp image quality that competes with long-throw native 4K projectors.
- **High Image Sharpness:** Delivers exceptionally sharp images, comparable to those of long-throw native 4K projectors.
- **Accurate Color and Calibration:** Offers highly accurate color reproduction right out of the box, with effective calibration controls for further image refinement.
- **HDR Compatible:** 4K resolution with Dolby Vision HDR, HDR10, and HLG support.
- **Cost Consideration:** Despite a sub-$10K MSRP, the projector is a premium investment compared to more affordable options like the Hisense PX2-Pro.

Hisense PX2-Pro ($2,500)

Although car analogies are risky, the Hisense is essentially a Toyota while Leica is Lexus. Let's start with the fact that it's known both products come from the same manufacturer. Inside, a lot of the technology is similar: DLP, triple laser, Android TV. Of course, the Hisense is tuned differently, does not sport the souped-up Leica lens, and has a lower 2400 ANSI lumen rating, but it comes surprisingly close to the Leica in terms of overall picture quality. The Hisense PX2-PRO is an RGB triple-laser projector or 'TriChroma Laser' in Hisense parlance. It is spec'd to reach 107% of the BT.2020 color space and offers 2,400 ANSI lumen brightness and a lifespan of over 25,000 hours. With support for 4K HDR, the PX2-PRO creates detailed images and because the lens has a focus function, it is compatible with multiple screen sizes from 90 inches up to 130 inches.

If you are looking for a polished, high-performance UST from a trusted major brand, the PS2-Pro beckons. Hisense has been in the DLP UST business for years and its experience and resources are readily apparent in this polished product.

- Ultra Short Throw Technology for images from 90 to 130 inches.
- 4K resolution with Dolby Vision HDR, HDR10, and HLG support.
- Game and Filmmaker Modes.
- RGB Laser lamp with a 25,000-hour life and Auto Geometry Calibration.

Formovie Theater ($3,000)

The Formovie Theater is the UST to buy if your viewing habits lean toward home theater. It offers higher contrast as well as better handling of dark scenes than any other UST that I have seen. It has the remarkable ability to render dark scenes with deeper black levels than any projector outside of the dedicated home theater models and do so without crushing shadow detail. The ALPD technology light source is a triple-laser plus phosphor design that surpasses the rec.2020 color gamut yet has no visible laser speckle.

When comparing it to other USTs with other projector critics, it was the Formovie that elicited gasps of awe when the lights were out. It also does a great job with the lights on, and its laser-phosphor light engine is free of laser speckle yet achieves vibrant color and is very bright, it is rated at 2,800 ANSI lumens and supports screen sizes up to 150 inches. Other notable Features include support for Dolby Vision as well as Dolby Atmos, and a sound system carrying the Bowers and Wilkins name.

- **Exceptional Contrast and Dark Scene Handling:** Offers superior contrast and adeptly manages dark scenes, achieving deeper black levels without crushing shadow details.
- **Advanced ALPD Technology:** Utilizes a triple-laser plus phosphor light source that surpasses the rec.2020 color gamut, eliminating visible laser speckle.
- **Impressive Brightness and Large Screen Support:** Rated at 2,800 ANSI lumens, suitable for screen sizes up to 150 inches, ensuring vibrant colors even in well-lit rooms.
- **Dolby Vision and Dolby Atmos Support:** Features compatibility with both Dolby Vision and Dolby Atmos for enhanced visual and audio experiences.
- **Bowers and Wilkins Sound System:** Includes a high-quality sound system carrying the prestigious Bowers and Wilkins name.

Epson EpiqVision LS800 ($3,500)

Epson's EpiqVision LS800 is the living room champ and the projector I'd recommend for general mixed use like watching sports, playing video games and streaming shows, plus watching movies. It has several differentiating factors versus all other 4K USTs on the market that I am aware of at this time. Namely, it is not DLP. It uses Epson's three-chip LCD tech, just like its home theater projector. That means there is zero rainbow artifact. But Epson keeps the pixel-shift restricted to 2-way on this model, so it's not quite as crisp as the 4-way shift found on the DLP models.

However, what Epson has over the others is an extremely aggressive 0.17:1 throw ratio. What this means is the Epson sits closer to the wall for a given image size versus competing USTs. The chassis is also shallower, additionally reducing the protrusion. When you start measuring out what it takes to install a UST with a 120-inch screen using a credenza as the projectors stand you will see the benefit of the shorter throw ratio because you don't need specialized furniture to make everything fit.

- **Optimal for Mixed Use:** Ideal for watching sports, playing video games, streaming shows, and watching movies in a living room setting.
- **Three-Chip LCD Technology:** Uses Epson's proprietary three-chip LCD technology, like its home theater projectors, eliminating rainbow artifacts.
- **Aggressive 0.17:1 Throw Ratio:** The projector has an extremely low throw ratio, allowing it to be placed closer to the wall for a given image size compared to other USTs.
- **Narrow Chassis Design:** The shallower chassis design reduces the protrusion, making it more adaptable to different living room setups without the need for specialized furniture.
- **Basic Pixel-Shift Technology:** Features 2-way pixel-shift technology, which doesn't achieve the same crispness as the 4-way shift found in DLP models.

Lifestyle Projectors

When UST projectors first came out and introduced laser light sources at prices well below what the home theater long throws offered, I wondered how long it would take before lifestyle long throw projectors that leveraged these light sources appeared.

It took a few years but now there's a healthy selection of comparatively compact cube-shaped projectors that output tremendously bright, vibrant, and sharp images. They're defined by a combination of image quality, portability and affordability. In fact, currently my primary living room display is a XGIMI Horizon Ultra and it produces a picture that looks like a giant TV.

XGIMI Horizon Ultra ($1,700)

This could well be the most exciting new projector of 2023. What it brings to the table for the money is simply astonishing. High brightness, excellent color accuracy, a sharp lens with a bit of optical zoom, and a polished user interface make it easy to recommend for anyone getting into projection.

I use one at home with a 150-inch screen that's simply painted on a wall. The screen cost me under $100 in supplies from Home Depot. To my eyes, with the lights out it looks like a giant TV with sports and games and shows, or else like a full-on movie theater screen with movies. I watch Eagles football games on it and marvel at the fidelity of today's 1080/60p and 4K sports broadcasts, which look good even at these huge screen sizes.

XGIMI uses a hybrid laser-LED light source that avoids laser speckles but is bright and vibrant. The on-screen image is practically free of any visible artifacts and unquestionably of cinematic quality. If this is your budget and you have room for one projector in your life, there's a strong argument to be made it should be this XGIMI.

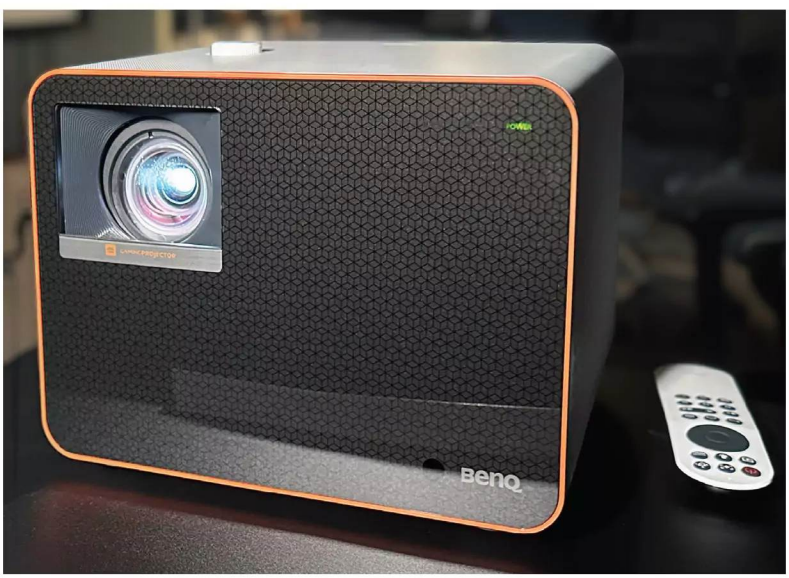
- Thanks to its portability all you need is a blank wall to enjoy a big screen viewing experience. If you're watching a movie, be sure to turn out the lights.
- 4K resolution with Dolby Vision, 2300 ISO lumens, and Dual Light Technology for bright, accurate colors.
- DLP display technology, 0.47" DMD chip, supports HDR10, HLG, Dolby Vision, and 3D content.
- Intelligent Screen Adaption 3.0 with auto keystone correction, auto focus, and intelligent screen alignment.
- Dual 12W Harman Kardon speakers, DTS Studio Sound.
- Wi-Fi 6, Bluetooth 5.2, with HDMI, USB, LAN, headphones, and optical ports.

BenQ X3100i ($2,400)

This projector relies on an LED light source to pump out up to 3300 ANSI lumens. That's super bright! But also appropriate to a projector that is sold as an "immersive open world gaming projector." And it is indeed optimized for gaming with the lowest input lag you're going to find in this selection and support for 240 Hz refresh rates in 1080p.

Of course, you can use this projector for movies and TV as well as gaming. It is as adept at showing movies and TV shows as any of the other options here.

While it is the priciest of these compact long-throw options, what makes this projector special is it features both 1.3X zoom and vertical lens shift. These functions make it easier to position and match up to a screen. Combined with its incredible brightness you've got a projector that may well be worth considering for permanent installations and not just portable applications.



- Immersive gaming with enhanced contrast, true-to-life colors, and 4K HDR.
- 3D with BenQ's CinematicSound technology.
- 3300 ANSI lumen brightness, flexible installation with 40-60% vertical lens shift.
- Throw ratio of 1.15-1.5, 1.3x zoom, and digital zoom for a 100" screen from 2.5m.
- Customized game settings, 4.16ms low input lag, Auto Game Mode, and FPS Crosshair.

Formovie X5 ($1,500)

The value proposition of the Formovie X5 is extremely high thanks to its blend of high brightness, high contrast, color accuracy and sharp lens. It is a fixed lens, so for permanent installs you'll need to finesse the placement to get the most out of it, but the end result looks competitive with home theater projectors when the lights are out.

There is nary a trace of laser speckle, despite the rich, saturated colors it reproduces. So you might be wondering what's the catch? It's that this projector is not a U.S. specific model, meaning you have to be willing to deal with menus in Chinese. But it's really not that tough, there is an English language menu in there as well, and once you figure out how it works it's easy enough to use. Just know that it's not going to be as polished a user experience as the Hisense and BenQ options. As far as picture quality goes, when it comes to making movies look like they do in a commercial cinema (which also use DLP) I believe it's a toss-up between this projector and the Hisense C1, but they have different qualities to recommend them with the X5 doing best when called upon to deal with dark scenes.

- Sleek design, 1.07 billion color gamut, 2,450 CVIA lumens for bright images, ideal for home theaters.
- Includes Amazon Fire TV Stick 4K Max for enhanced user experience in the USA.
- Hardware design by Denmark's Kvadrat, enhancing home theater aesthetics.
- Projection sizes from 60" to 1,000", offering cinema-like immersion.
- ALPD laser display for a broad color range.
- Auto-correction for perfectly aligned images in any room setup.
- Ambient light adaptive technology for optimal image quality in varying light conditions.
- Laser autofocus for hassle-free, sharp image projection.

Hisense Cube C1 ($1,500)

It's not as bright as the other projectors in this section, and it is more laborious to set up. For example, it's not as fast or as good at automatically making the image fit to a screen. So why is it here? Because I have noticed that with the right content, the RGB triple-laser covers a wider color gamut than the other compact projectors. The result is a more vibrant and realistic image.

Like any projector, the Cube C1 does its best work under a relatively limited set of conditions, when the lights are out and with content that exploits its ability to create intense colors. Video games look amazing. So do live sports. Same goes for animation, CGI explosions and other bright scenes. While the Hisense struggles with star fields, it excels in displaying content like nature documentaries and movies with fiery special effects.

With the C1, there is a hint of laser speckle projecting on a matte screen, but it is invisible from my couch and viewed from 13 feet away. In my judgment, the picture gains a lot from the extra vibrancy and the result is the projected image looks better than the 1600-lumen spec and modest contrast/black levels would suggest. In this case, seeing is believing.

- 110% BT.2020 color space, TriChroma laser engine for over 1.07 billion color shades.
- Dolby Vision and Dolby Atmos certified.
- Trichroma Laser Technology for ultra vivid colors.
- AutoMagic AI adjustment for easy setup and portable use in home theaters, gaming, and outdoors.

BOWERS & WILKINS 703 S3 LOUDSPEAKERS

When Less is More

RATING

PERFORMANCE ★★★★★

BUILD QUALITY ★★★★★

VALUE ★★★½☆

By Mark Henninger

MY EXPERIENCE with Bowers & Wilkins dates back over thirty years to my high school days, when I first admired the 801 Matrix in Stereophile magazine. My longstanding interest in the brand has led me to review products, visit their factory in Worthing, England, and witness their speakers at Abbey Road Studios. Naturally, I was eager to review the 703 S3 towers, both on their own and as part of a 5.4 (four subwoofer) surround-sound system.

This review is a bit of a mea culpa. Each year since 2012—when Dolby Atmos was introduced—I have favored the benefits of more speakers. Suddenly it was not just 5.1 or 7.1, more speakers were more immersive, right? Just a few months ago I reviewed a 9.4.4 system to get a taste of what it's like to go all-out with both a Denon A1H AVR and a Marantz AV10 processor. But for these 703 S3 speakers, I decided to go all the back to a simple 5.1-channel system for movies and also focus on their capabilities when handling 2-channel music playback. The goal, to hear what fewer but better speakers offer versus spending a similar sum on a huge Atmos system.

FEATURES

The new 700 S3 Series from Bowers & Wilkins encompasses a total of eight models. The 703 S3 is the smaller of the two tower models, it has two 6.5-inch bass drivers and a rear-firing port, versus the 702 S3's three bass drivers and down-firing port. A premium high-performance floorstanding loudspeaker, it is equally suitable for a 2-channel stereo system and for multi-channel home theater use.

This speaker is notable for its distinctive 3-way, 4-driver design. At its core, the 703 S3 features a 1" decoupled carbon dome tweeter. The tweeter is isolated in its own compartment that rests on top of the cabinet, a concept pioneered with the 801 matrix that the company refers to as "Tweeter-on-Top."

The midrange frequencies are handled by a 6" decoupled Continuum Cone FST (fixed suspension transducer) driver, which produces smooth and natural vocals thanks to improved flexibility and lower distortion and coloration versus traditional cone designs that employ a conventional spider. For the lower end of the spectrum, dual 6-1/2" Aerofoil Profile drivers, constructed from a stiff, robust foam "sandwich" composite, deliver deep and powerful bass.

With a sensitivity of 90 dB, it takes some power to really get it going, the recommended power range for the 703 S3 is between 30 and 200 watts. However, the 8-ohm rated nominal impedance promises compatibility with a wide range of amplifiers.

On the rear panel, the speaker features dual pairs of gold-plated binding post terminals, accommodating bi-amp or bi-wire configurations. The terminals are compatible with 4mm banana plugs, as well as 6 and 8mm spades, and can also handle bare wires up to 4mm in thickness. A two-piece foam port plug is included, offering users the ability

to fine-tune the speaker's low-frequency response.

Attention to detail extends to the speaker's design and convenience features. A magnetically attached, removable grille makes for easy access and cleaning, and the included plinth and carpet spikes provide stability. The 703 S3, measuring 11-$^{7}/_{16}$"W x 44-$^{7}/_{16}$"H x 14-$^{5}/_{8}$"D and weighing 63.5 lbs, is a substantial piece of audio equipment.

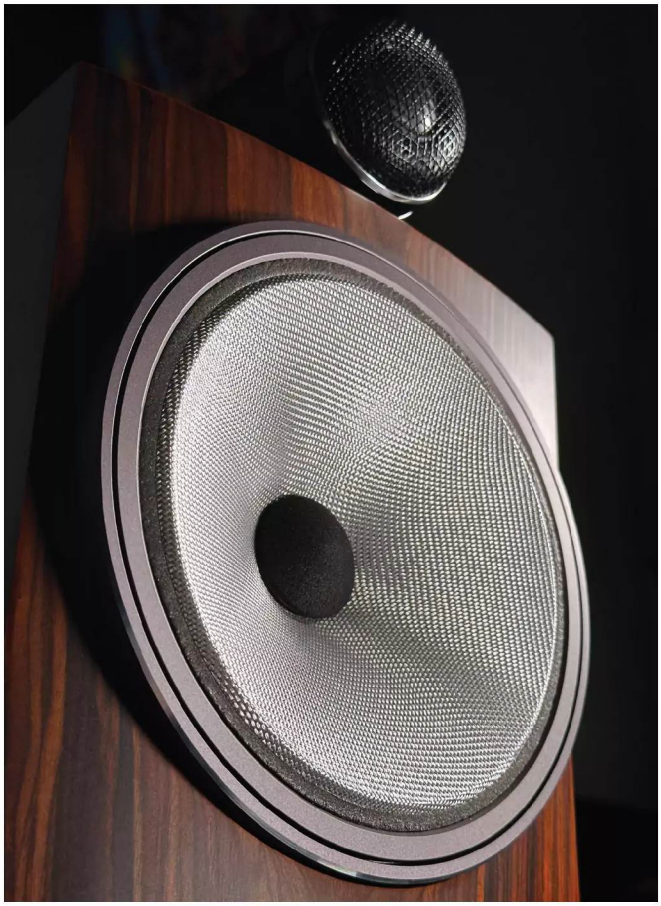
UNBOXING, SETUP, AND FIRST IMPRESSIONS

Upon unboxing the 703 S3 Towers, their craftsmanship struck me as not just high-quality—it is luxurious. These visually appealing speakers would fit well in any elegantly decorated room, not limited to dedicated listening areas.

The look of this speaker is unmistakably Bowers & Wilkins. The Mocha wood grain finish complements the rest of the aesthetic. In my opinion, it would be a shame to use a grill on this speaker because the drivers are presented in such an attractive manner, which also happens to be a matter of form following function!

Even the packaging impressed me with its ease of handling and robust protection. Assembling the speakers was straightforward, thanks to the solid, bolt-on plinth outfittable with either spikes or rubber feet, enhancing the towers' stability and presence.

In this review, the towers served as the left and right channel speakers in a 5.1-channel system.



The electronics to power them are the Marantz AV10 preamp/processor paired with a Marantz AMP10 16-channel home theater amplifier. The latter is rated at 200 watts per channel (2 channels driven) into 8 ohms and 400 watts into 4 ohms, making it a perfect match for these towers.

Also in the 5.1-channel, 5.4-speaker configuration is the Bowers & Wilkins HTM71 S3 3-way center channel, a pair of 705 S3 bookshelf speakers, and four DB3D subs. The reason I asked for four subs is that the Marantz AV10 supports up to four discrete subs. Notably, the DB3D's frequency response is rated at 10 Hz - 350 Hz (-3dB), even one of them can turn this into a full-range system. Using four of the subs offers smoother bass response and also makes it possible to play the speaker system to its outer performance limits.

ROOM CORRECTION

While I consider room correction and EQ a necessity for pretty much any multi-channel system—especially if it integrates one or more subwoofers—another use I have for taking the measurements is seeing how the speakers perform in my room, understanding what the uncorrected response looks like at various seating positions. Measurements are what tell me if the published specs are translating to my at-home experience.

These towers truly do not need EQ or room correction to sound fantastic. If you run them full range and set them up properly you'll certainly have an engrossing listening experience. But even those who eschew any form of correction can benefit from some measurements that reveal the response at the main listening position; you can tweak the response by experimenting with toe-in, placement, and seating position.

But in my view, it is with the judicious application of room correction that things get exciting. The result of running Audyssey with a dozen measurements produced a smooth response in the bass. The midrange and treble already look good, so I used the MultEQ-X software to limit room correction to 300 Hz and below.

For all listening, I left the 703 S3 port unplugged. It is, after all, a ported speaker design, and the port itself works well, not once calling attention to itself. But for listeners who find there is too much bass in an un-EQ'd system, the option is there.

At a Glance

- \+ Holographic soundstage and imaging
- \+ Tight and articulate bass
- \+ Aesthetically pleasing
- \+ Easy to assemble
- − Somewhat low sensitivity
- − Can't place Atmos modules on top of the towers

Price: $3499

www.bowerswilkins.com

PERFORMANCE AND LISTENING

The 703 S3 speakers deliver an exceptionally refined soundstage and imaging, adept at crafting a broad aural panorama or honing in on intricate details, depending on the audio mix. In the loft where I live and review gear—a 17 by 35-foot space with 13-foot ceiling—they excel without any need for equalization or other adjustments, just a bit of toe-in. They exemplify high-fidelity audio through their transparency and clarity. Whether transporting

BOWERS & WILKINS 703 S3 LOUDSPEAKERS

listeners into a studio's intimate setting or bringing the vibrancy of a live performance into a room, these speakers capture the essence of both live recordings and studio productions aimed at emulating live ambience.

Their versatility shines in both a 5.1 setup and as a standalone two-channel music system. In multi-channel configurations, they work in harmony with the center channel and other speakers of the 700 S3 line, enhancing the overall holographic transparency. The steering, which is essentially the passing off of sounds from one speaker to another creating the illusion of movement, is seamless. This makes them particularly suitable for listening to complex immersive mixes filled with nuance, including multichannel music and movie soundtracks.

Impressively, they maintain the scale of the soundstage with precision, neither understating nor overstating it. The sound character they present—whether expansive or intimate, dense or sparse, ambient or direct—faithfully reflects the original mix and mastering of the audio content. These speakers consistently distinguish themselves by their ability to reproduce sound accurately, without imparting their own coloration.

During my extensive testing with various music genres and films, the speakers consistently delivered an enveloping and precise sound. They showcased their versatility in handling complex electronic music and movie soundtracks with ease. Their genre-neutrality was particularly evident in the range of content they could flawlessly reproduce.

Because this speaker system and review came immediately after a 9.4.4 Dolby Atmos system from Arendal—one that costs less than this 5.4 system I had plenty of time to think about the benefits of having more speakers for total spatial envelopment versus the benefits of concentrating a budget on fewer, but overall better speakers.

While subjective, I feel strongly that this 5.4 system more often than not provides a superior listening experience than the 9.4.4 system due to each channel being of higher quality. Most impressively, that's even the case for the center channel speaker, the HTM71 S3, which performs like a tower. I thought that I would miss having the extra channels and the Atmos immersion, but... after listening to dozens of movies and hundreds of hours of music now it seems the money—in my opinion anyhow—is better spent concentrated on these fewer speakers.

Specs

DESCRIPTION: 3-way, vented-box system.
DRIVE UNITS: 1x ø25mm (1 in) Decoupled Carbon Dome high-frequency.
1x ø150mm (6 in) Continuum cone FST midrange.
2x ø165mm (6.5 in) Aerofoil Profile bass.
FREQUENCY RESPONSE: 46Hz - 28kHz ±3dB.
FREQUENCY RANGE: 30Hz to 33kHz.
IMPEDANCES: Nominal 8Ω, minimum 3.1Ω.
SENSITIVITY: 90dB spl (2.83Vrms, 1m).
RECOMMENDED AMPLIFICATION: 30W - 200W into 8Ω.

MUSIC

Listening to the 703 S3s with no EQ, no sub, full range as a true two-channel system is incredibly rewarding. Make no mistake, these speakers stand on their own and really dish it out if you feed them the power they demand, Bassnectar's album *The Golden Rule* opens with the eponymous track, starting with delicate synth chimes, flawlessly rendered by the 703 S3s. They offer a solid bass foundation without muddying the highs. The climax hits like a tight wall of sound, filling the room with energy but not losing focus. The beats are as palpable as they are audible.

The next track "Unlocked" throws down the aural gauntlet with dramatic synth pads and Rye Rye's agile rapping. The 703 S3s deliver her vocals with precision, while the subwoofers add visceral energy. The bass here isn't necessarily deep; it's textured and varied. The towers effortlessly reproduce the complex bass lines, adding depth and dimension that elevate the track to a tactile, highly engaging listening experience.

Feeling the music emerged as a consistent theme with the 703 S3s. This has the almost magical effect of making a live music recording sound like it really is live. Believability is in the microtextures found in the deeper layers of a mix, rendered here with great verisimilitude.

One of my favorite tests of a speaker's mettle is "Disc Wars" from the *Tron: Legacy* soundtrack. It's Daft Punk's synths *plus* the London Philharmonic Orchestra. It's thick, and it is easily diminished by a speaker that can't keep up with the dual demands of a full orchestra and relentless subwoofer-crushing synth bass.

I auditioned the track at

live music volume levels three separate times. First with the 703 S3s alone, 2.0, no room correction. Then as a 2.1 system, with just one DB3D pitching in below 40 Hz while the speakers run full range, again no room correction. And then I let loose the big guns and ran all four subs along with the speakers while using a 60 Hz crossover and applying room correction below 300 Hz—which is roughly where room effects start to dominate the bass response. The result? Three distinct presentations, each with its merits although I won't lie, the four subwoofer system is the best.

The 703 S3s on their own sound organic, lucid, painting stunning soundscapes filled with sonic filigrees with ease. The bass is taut and digs deep enough that a sub is not missed. But with measurements, I can see that in-room response tracks what the specs claim, and by 30 Hz or so there's not much left. However, add just one DB3D sub, and you've got a full-range system that plays clean down to 20 Hz and below. You can hear and feel that deeper foundation, but the sonic character of the system is similar to the subwoofer-free configuration.

And then there's the four-sub system. My kind of system, intense. Scary, even. Granted, four DB3Ds cost $14,000 so they better deliver something profound. And they do. I've never had a system shake me like this with subwoofers so small. With 4,000 watts pushing a total of eight 8-inch drivers, the displacement is there to move the air. End result: I got goosebumps.

Some music demands bass deeper than just about *any* passive tower can deliver. An example is Rutter's "Requiem: Pie Jesu" as performed by the Turtle Creek Chorale, the Women's Chorus of Dallas. In it are a couple of 20 Hz and one 16 Hz organ note—an infrasonic blast that is utterly clean and incredibly powerful. This is where the four DB3D subs come into play, because the 703 S3 can't play that low. But notably, the track sounds almost the same with and without the subs, except when the organ comes in with the deep notes. Maybe you don't need four DB3Ds for a 2.1 system, but it sure is a nice luxury!

MOVIES

This is where the mea culpa happened, my realization that fewer but better speakers is a wise(r) path. Granted, with any good system chances are you won't know what you are missing because you'll be enthralled by what you've got. So here's the question: What's more enthralling, more speakers, or fewer but higher fidelity speakers? I can't escape the conclusion that higher fidelity pays the greater dividend.

Now, there certainly are movies that have a lot of overhead Atmos effects, *Gravity* (2013) is a good example. But unless you fetishize that effect, most of that and just about any other movie revolves around sounds coming from the front, with dialog and soundtrack being key. And to me, that's the key. There's nothing gimmicky about dialog clarity.

I watched a couple dozen movies on the 5.1 system over the course of the review. From *Oppenheimer* to *Barbie* to *Gran Turismo*, what blew me away is the seamlessness of the circle of sound created by the five speakers, and how the HTM71 S3 center channel manages to be as "invisible" as the towers, which is to say that it just blends into the soundscape, it is not localizable. Tonality is maintained off-axis because comb filtering is controlled by the center's three-way design.

When used in home theater, the 703 S3's bass extension is not enough to handle on their own what modern movies demand. The subs are the icing on the cake, because what they deliver—especially after a proper tuning with Dirac Live or Audyssey XT32 (both yield excellent results)—is bass that makes my living room sound and feel like a high-end dedicated home theater.

CONCLUSION

The Bowers & Wilkins 703 S3 Tower Speakers justify their price through their exceptional performance and aesthetic appeal. They cater to a wide range of audio content with ease, making them a versatile choice for any audio enthusiast. The system's ability to create an immersive soundstage surpasses the need for additional Atmos capabilities.

However, their high cost may be a deterrent for some. For those seeking a more economical option, Bowers and Wilkins offer alternatives in the 600 S3 series that might fit the bill, particularly in home theater setups.

Without question, these speakers are an ideal choice for those who value luxury performance. They are a testament to Bowers and Wilkins' commitment to delivering quality in every aspect of their products. Despite their limitation in Atmos integration and a sensitivity rating that requires a powerful amplifier, their overall performance and design excellence make them a highly recommendable investment for the discerning audiophile.

The Verdict

Luxurious speakers that reveal music's emotional core, allowing you to connect with it on a deeper level.

BOWERS & WILKINS DB3D 8" DUAL-OPPOSED SUBWOOFER

Deep Concentration

By Mark Henninger

RATING

PERFORMANCE ★★★★★

FEATURES ★★★★½

BUILD QUALITY ★★★★★

VALUE ★★★★½

IN THE realm of high-fidelity audio, the Bowers & Wilkins DB3D subwoofer offers a fusion of compact design and powerful performance. Priced at a premium $3,499, this subwoofer is a statement piece that offers performance to match Bowers and Wilkins speakers like the 700 Series S3 models used in this review.

The DB3D is at once one of the most expensive and one of the most compact subwoofers I've reviewed. We are talking $14,000 worth of subs. However, this sub's design is not strictly about getting maximum decibels per dollar. If that's your sole goal, best to look elsewhere. The reason? There is a direct correlation between a sub's size, output, and cost. Offering the capabilities of a large subwoofer in a compact package costs more, not less.

So, big bucks, small subs... what's the payoff? I can tell you what I got out of the DB3Ds. I easily fit four 10 Hz-capable, self-tuning subs in my urban loft's living room area. The resulting bass is dedicated home theater-quality.

It is important to emphasize that with this system, my priority is *not* maximum output. It's maximum bass extension and fidelity.

FEATURES

The DB3D offers a user-friendly experience for setup and adjustments. A key feature is control of the sub via the dedicated "dB Sub" app. It's crucial, actually, because the sub itself does not offer physical controls, you must use the app to tweak the settings. Plus, you'd miss out on the built-in automatic room tuning. The app communicates using Bluetooth and worked seamlessly on my iPhone and my Samsung Galaxy, all four subwoofers showed up immediately the moment after I installed and launched it.

The DB3D's compact design leverages a pair of 8-inch Aerofoil drivers in a dual-opposed, force-canceling alignment. This arrangement minimizes distortion caused by mechanical motion while maximizing cone surface area, making possible the use of a small cabinet. For comparison, a pair of 8-inch drivers are equivalent to an 11.3-inch driver in a sealed sub enclosure.

The result is a dense cube, measuring 14.1 x 12.6 x 11.8 inches and weighing 55 pounds. The availability of gloss black, satin white, and rose nut finishes—seamlessly matching the looks of 700 Series S3 speakers. Inputs include dual XLR and RCA, alongside a 12-volt trigger and RS-232 connector, catering to custom installs and automation.

Owing to the relevant law of subwoofer physics that states "there's no replacement for displacement," pressurizing a room to create visceral infrasonic experiences requires the use of multiple DB3D subs to effortlessly fill this gap.

There are two larger models in the series, the dual 10-inch driver DB2D and dual 12-inch DB1D. All three subwoofers sport the exact same frequency response specification: 10 Hz to 350 Hz. It's a strong hint that a carefully-tuned DSP is in charge of the show as the amp and drivers plumb the depths. A 1,000 watt (peak) class D Hypex amplifier provides the electrons. WIth such a small yet powerful sub, high-efficiency amplification is important because there's not a lot of surface area to dissipate heat.

With this sub, you get unbalanced RCA and balanced XLR inputs on the rear panel. For any long run, balanced connections are better because they intrinsically resist electromagnetic interference.

SETUP

Ease and flexibility of setup and placement is the name of the game with these subwoofers. They are capable of delivering full-range frequency response, all the way down to 20Hz (and below). The room tuning might make you nervous because it uses the phone's mic. No need, it cleverly calibrates the phone by having you place it on the edge of the sub and playing a sweep it records nearfield.

Since the Marantz AV10 processor has four XLR outputs for subs, that's the wiring option I chose. But I also briefly connected one sub with a 30-foot RCA cable to see how that worked. Happily, I heard no hum.

When tuning with the app, you get the benefit of deciding to focus the bass response on a single seat, in a tight area like a couch, or spread around the room across multiple seats. Measurements only take a minute or two to perform and the app shows you the frequencies where compensation is applied (via a minimalist graphic). Results jibe with what the Audyssey XT32 found when I ran it on the uncorrected subs with the Marantz AV10.

I ran the Audyssey setup again, after tuning each of the four subs using the dB Sub app. The difference is apparent in the amount of correction Audyssey subsequently applied. The starting point is a lot more linear. So the correction Audyssey applies is also less extreme. The combined correction is smoother than using just one correction system or the other.

One thing I want to stress, this sub's built-in room tuning capability also makes it a great choice to use in a minimalist 2-channel system, for example self-powered speakers with a subwoofer-out, or a streaming amp that does not have room correction among its features. You can achieve a far more optimal sound with a self-tuning sub, especially if you focus on optimal response at the main listening position.

PERFORMANCE

As noted earlier, reproducing bass below 20 Hz is usually off-limits to a sub this size. But, with a kilowatt of power on tap, the DB3D's ultra-rigid Aerofoil cones overcome the air-spring effect of the small enclosure. And keep in mind the sub's already small interior is partly filled with the drivers and the amp, it's not just empty space in there.

The frequency response is truly impressive, ranging from 10 Hz to 350 Hz (minus 3 dB). This is verified by multiple rounds of room correction measurements. I have seen other subwoofers with similar specifications, where the cones barely start moving at that frequency. Or subs that produce so much mechanical noise dipping below the infrasonic threshold that you are mostly listening to distortion, not bass.

Crucially, with the DB3D I can't actually hear anything mechanical, even with pure sine waves at 10 Hz. If you spend big bucks on subs, covering the range you *can* hear is a must! Anything you get below what's humanly audible is a bonus. The DB3D plays cleanly and with ease to 16 Hz, so even *one* sub legitimately turns a pair of good speakers into a true full-range system.

The total surface area of these four subs is equivalent to a single 22.6-inch driver, or else dual 16-inch drivers. For real! There is no way I can fit a 22-inch subwoofer in my living room. And dual 16-inch subs? As awesome as that approach is, it would be very difficult because the spots I have to put four subs are not that large. The flexibility in placement the DB3D offers ensures that the four subwoofers can be optimally positioned for the best acoustic impact—including directional bass—regardless of room layout or constraints.

In a full 5.4-speaker system, including Bowers & Wilkins 703 S3 towers (also reviewed in this issue), 705 S3 bookshelf speakers, and a HTM71 center channel—all driven by a Marantz AV-10 pre-pro and amp-10 home theater amplifier—the four DB3D subs provided the rock-solid foundation for a superb ultra-high-performance system.

MOVIES

For movies, the DB3D has it all. Power, finesse, depth, texture, delivered with ease. Take *Meastro* for instance, and Bradley Copper's performance as Leonard Bernstein conducting Mahler's *Second Symphony*. The crescendo pushed the system (and my neighbor's patience) to its limits. Limits I rarely test, where there's a feeling the entire room's air mass is moving in unison.

Screening *Oppenheimer* shook the senses. Nolan, known for putting sound effects and music above chatter, skips Dolby Atmos. Yet, in a commercial Dolby Cinema amphitheater, where I saw it debut, *Oppenheimer*'s sound was top-notch with bass that made it feel as if there are actuators under the seats (there are not). At home, this system matched that feeling. It's not just sound in the air; like with *Maestro* it's a feeling, deep in your bones.

And the classic but re-released *Aliens* with Atmos sound? The DB3Ds added a whole new layer of thrill, turning suspense into a physical sensation. When the atmosphere processor explodes at the culmination of James Horner's orchestral buildup, goosebumps ensue.

MUSIC

Flashback to 30 years ago, when I bought my first Bowers & Wilkins subwoofers—a pair of Acoustitune passive subs. From then onward, I have religiously checked out Coil's track "Her Friends the Wolves" from the album *Stolen and Contaminated Songs*. When the track gets going—which takes a while—a dry, growling, "edge of the infrasonic threshold"-type bassline settles in. A lot of systems miss it altogether. The effortless rendering of the full bass palette of this classic track represents endgame-quality fidelity.

With music, one DB3D makes a great pairing for a 2.1 sub/sat system featuring a pair of the 705 S3 speakers. For even more impact, a pair of DB3Ds offer just the right amount of oomph when matched up with the 703 S3 towers that I used for my two-channel music sessions.

But, cost notwithstanding, four DB3D subs is certainly where it's at for sublime bass that is consistent, effortless, seemingly bottomless. And with so much music now released in Atmos, you can leverage a multi-channel and multi-sub system to its full capacity.

CONCLUSION

The Bowers & Wilkins DB3D is a marvel in the world of compact, high-performance subwoofers. For those valuing aesthetics, space efficiency, and deep, clear bass, it's an investment worth considering. Its design aligns with the needs of users who want to integrate high-quality audio into their space without compromising on style.

Bowers & Wilkins have once again proven its prowess in the subwoofer domain, a journey I've personally witnessed since owning their Acoustitune subs. With the DB3D, they've not just created a subwoofer; they've sculpted a compact acoustic masterpiece for the discerning audiophile. Its deep, clear bass makes it a valuable addition to any sophisticated audio setup.

Specs

FREQUENCY RESPONSE: 10 Hz to 350 Hz (-3 dB)
POWER OUTPUT: 1,000 watts (peak)
INPUTS: Dual XLR, dual RCA
DIMENSIONS: 14.1 x 12.6 x 11.8 inches
WEIGHT: 55 pounds

At a Glance

- \+ Compact size
- \+ Deep, clean bass
- \+ Easy to set up and adjust
- \+ Available in three finishes
- − High price
- − One sub might not be powerful enough for large rooms

Price: $3499

www.bowerswilkins.com

The Verdict

The Bowers & Wilkins DB3D is an excellent choice for those who want a compact subwoofer with powerful performance. Its high price may be a deterrent for some, but its features and performance make it worth the investment.

SONY HT-A5000 SOUNDBAR

Sonic Surprise

By Thomas J. Norton

RATING

PERFORMANCE ★★★★½

FEATURES ★★★★½

ERGONOMICS ★★½☆☆

VALUE ★★★★½

OVER THE YEARS I've reviewed hundreds of audio and video products covering all the usual bases. But not up to now a soundbar. While there are thousands of audio and video fans willing to invest in a home theater, either modestly priced or obscenely expensive, to most folks a "home theater" means simply a big-screen TV and enough comfy seats to accommodate the family and perhaps a few friends. But even they understand, deep down, that those TV speakers aren't really up to the job when they settle in to watch Top Gun: Galactica. For them an add-on soundbar, typically with only one box to deal with plus a few cables, might be a revelation.

Soundbars come with a wide range of capabilities. In general, they include their own on-board electronics driving built-in speakers. At their most basic they might offer just the left and right channels and a way to connect to a TV and replace the latter's typically mediocre audio quality. But the Sony HT-A5000 is far more capable than that.

DESCRIPTION

At roughly 4 feet in width, the HT-A5000 contains six small loudspeakers (see Specifications): forward-facing left, center, and right, upward-firing left and right (assisted by a pair of tweeters), a small on-board subwoofer, plus the internal amps needed to drive them all. Sony also offers a pair of optional wireless surround speakers plus a separate subwoofer (also wireless). But those options will nearly double the price. This review covers only the HT-A5000

on its own, which can often be found online at considerable discounts from its $1000 MSRP.

The HT-A5000 offers five physical connections located in a recessed rear panel: Toslink optical, HDMI In, HDMI Out, USB, and S-Center. The detachable power connection is located on the soundbar's rear at the far right.

The S-Center output offers the option to link the soundbar to a compatible port on your TV, allowing the latter's own speakers to join in the center of the party. To our knowledge, however, the corresponding S-Center *input* is only available on newer Sony TVs and not on older Sonys nor on any other TV brand, new or old. We did review such a Sony TV recently, but it had to go back before there was time to use it in this review. The television used here was the TCL 85QM8 we reviewed recently. It doesn't offer an S-Center input so that feature was not tested here.

For the HT-A5000 to be fully functional one of your TV's HDMI inputs must be either eARC (enhanced Audio Return Channel) or ARC-capable. ARC is similar to eARC but without the latter's enhancements. ARC is available on some older sets and usable here as well, though with some limitations. If your TV has neither ARC nor eARC I don't recommend the HT-A5000 (or for that matter most other advanced soundbars).

The HT-A5000 also comes with its own remote control, which is important for the soundbar's setup and operation. It offers two optional, fixed response settings (Voice and Night, neither of which I recommend), adjustment for rear channel level (functional only if you've added Sony's optional wireless surrounds), a level control (which overlaps somewhat awkwardly with the TV's level control), and a three position subwoofer level adjustment that can control both the soundbar's built-in subwoofer and also Sony's optional wireless subwoofer (if used). A Sound Field button on the remote also offers a choice between three different fixed audio options: DSEE Extreme, Audio DRC, and Advanced Audio Volume, none of which I spent much time with. The HT-A5000 offers no user- adjustable graphic equalization.

Once the TV and the soundbar are physically connected the remote control's Home button can call up a range of options on your TV screen inviting you to select the source you want to watch or listen to. For audio-video sources (audio combined with video and not just audio) the Home control options I used most often were simply Watch, TV and HDMI.

On the audio-only front the HT-A5000 can play music files, either streamed or stored on a USB device plugged into the HT-A5000's single USB port or on your computer. You can also listen to audio from a mobile device such as your cell phone by wirelessly linking that device to the Sony soundbar. The Sony also offers Chromecast, plus both Alexa and Google Assistant voice control.

The Sony soundbar can do all that and more, but for the remainder of this review we'll focus on the HT-A5000's capabilities on audio-with-video sources. These include audio-video content up to and including multi-channel object-based surround audio formats such as Dolby Atmos and DTS:X. The HT-A5000 also provides a pass-through for any video accompanying the audio, up to and including 8K and high dynamic range (HDR10, HLG, and Dolby Vision). But the soundbar doesn't *process* video in any way--that's why it's a *soundbar*!).

The Sony can be hard-wired to external audio-video sources such as a Blu-ray player or gaming console. It can also play any streamed audio-video content (such as NetFlix, Disney+, Amazon Prime, YouTube, etc.) that your TV can access via Wi-Fi. The use of external streaming devices, such as Apple TV, are also possible but won't be addressed here.

SETUP

Sony's Basic Setup menu, accessible via the remote control's Home button, is straightforward. It includes a short series of test tones (Sound Field Optimization) designed to improve the soundbar's match to your room. How it does this, and precisely what it does, isn't clearly explained. But it only takes a few seconds and can be re-done as often as you like. This is *not, however*, an in-depth room EQ process comparable to Audyssey or Dirac Live. There's also an Advanced Setup menu, but I left all of those settings in their default positions and recommend you do the same, at least until you're comfortable with the HT-A5000's operation.

To squeeze the best out of the Sony HT-A5000 I first established a direct HDMI link from an external source (in my case a Blu-ray player) to the HDMI *input* on the soundbar. A second HDMI cable was then connected from the HDMI *output* on the soundbar to the eARC HDMI *input* on the TV. The audio is thereby captured at the input/output HDMI junction on the soundbar, while the video is passed on to the TV via the second HDMI cable. That's easy enough to follow.

But how does the audio from other audio-video programming (most of it from various streaming services and captured by your TV) get to the soundbar? Easy: it travels from the eARC HDMI port on the TV down the HDMI cable and into what was once the HDMI output on the soundbar but for this connection has become the input! What, what? Isn't that in a different direction on the cable? Yes, and that's the magic and the whole point of eARC ; it can pass signals in either direction!

My only setup disappointment here was in trying to use my cable box with the soundbar. Apart from substituting it for my Blu-ray player it in a soundbar's single available direct external connec-

At a Glance

- \+ Do-it-all abilities
- \+ Audio performance
- − Complexity
- − Intimidating manuals

Price: $1000

tion (which I'm certain would work but which didn't want to do) I couldn't find a solution. Perhaps Toslink optical (not otherwise used here) might well have helped, but my cable box is limited to two useful connections: power in and HDMI out. No Toslink audio. Your situation might be different.

SKIMMING OFF THE BITS

Digital audio compression is common on the audio in any audio-video source that traveled wirelessly at any point on its journey to your TV. The type of compression we're concerned with here is the selective discarding of digital data performed by a compression algorithm. The data omitted is judged by that algorithm to be audibly inconsequential to the perceived sound. (Many audiophiles will dispute this, but that's a subject for another day!). This type of digital compression is not *dynamic range* compression. The latter is irrelevant to this discussion. (Google *Loudness Wars* if you want to know more about this.)

Audio-video streaming services such as Netflix, YouTube, Amazon Prime, Disney+, and others invariably employ audio compression on all their audio feeds. Audio compression is needed for streaming to allows enough space for the video. (Audio-only streaming services, on the other hand, can often avoid such lossy compression, since even hi-res audio is far less demanding of transmission space than video.)

Bluetooth is a specific form of digital compression applied to a signal at the user end to provide wireless transmission over short (domestic) distances. Once the audio arrives at the HT-A5000 soundbar, if Bluetooth is engaged the likely already pre-compressed incoming audio source is treated to Bluetooth as well for the double whammy of audio compression. But the digital result of this combination should be no worse for sound quality than the pre-Bluetooth compressed source was before being Bluetooth-ed.

LISTENING

Apart from the direct uncompressed HDMI link from the Blu-ray player to the soundbar, using Bluetooth proved to be, at least for me, the best way to capture and enjoy a wide range of sources with minimum complexity. I won't explain here exactly how to achieve Bluetooth setup (the "pairing" between the TV and the Sony soundbar). The process involves settings on both the TV and the HT-A5000, and the settings will likely differ with the TV's make and model. Once complete, the presence of Bluetooth is indicated by a nearly invisible blue (naturally!) LED on the front right center of the soundbar.

The wireless content I auditioned was streamed from both YouTube and Netflix. Without Bluetooth, the wireless audio results were erratic: YouTube audio mostly worked but with intermittent audio on some selections. Netflix audio didn't work at all. But with Bluetooth everything I tried on YouTube and Netflix worked consistently with uninterrupted audio.

Specs

DIMENSIONS: 47 3/4 x 2 3/4 x 5 5/8 (W x H x D)
WEIGHT: 13.5 lbs.
INPUTS AND OUTPUTS: HDMI In, HDMI Out, Toslink optical, USB (Type A), S-Center
AMPLIFIERS: 50W per driver at 1kHz
BLUETOOTH: Ver 5.0 Communication
3D AUDIO FORMATS: Dolby Atmos, DTS:X, 360 Reality Audio
MADE IN: China

But I'll pause here with a splash of reality. The Sony HT-A5000 soundbar won't challenge the sound from a fully charged home theater with eleven loudspeaker channels: left, center, right, two back surrounds, front and back pairs of overhead Atmos speakers, and two subwoofers, all optimally set up and driven to within an inch of their lives (and yours?) by a high-powered audio-video receiver.

Unlike the HT-A5000, however, with its neutral grayish finish barely visible beneath the TV, such a full monte system will dominate your room. And while the Sony soundbar's peak output level will also be more modest, when pushed to its limits it might prompt nearby neighbors to organize a pitchfork and torchlight parade.

There's a huge range of interesting source material on YouTube videos, spanning audio-video quality from mediocre to exceptional. Among the latter is a large collection of short test clips employing either Dolby Atmos or DTS-X surround. Most of the clips were clearly produced by either Dolby or DTS to show off their respective formats at their best.

Most TVs these days with any pretension to state-of-the-art advertise that they're Dolby Atmos. But as I've said in the past, you can't really get a sense of the overhead channels in these formats when all of the loudspeakers are trapped inside the TV. But what about the HT-A5000 where the speakers, while outside of the TV are still very near to it and supplemented by separate height speakers firing upwards? Can this produce a palpable sense of both surround and overhead activity?

The answer in my room was... sort of. While my ceiling is symmetrical left and right, it isn't flat so it can't optimally reflect the upward-firing sound back down. I've used conventional upward-firing speakers in the past, but even then the sense of overhead action was limited compared to dedicated height channels positioned in, on, or near the ceiling. (Upward-firing Atmos, or any similar object-oriented audio format, has always been a compromise and can rarely match true ceiling- or near ceiling-mounted overhead speakers. But for most consumers the latter is wildly impractical).

On those purpose-made YouTube Dolby Atmos and DTS-X sample clips featuring birds, rain, and other pronounced effects at the sides, rear, and overhead, I did get the sensation of something happening overhead or slightly behind me. It wasn't overly precise nor constant, but it was an interesting experience. On no other source material I auditioned, however, did I get similar sensations, whether it was native DTS-X, Dolby Atmos, or not.

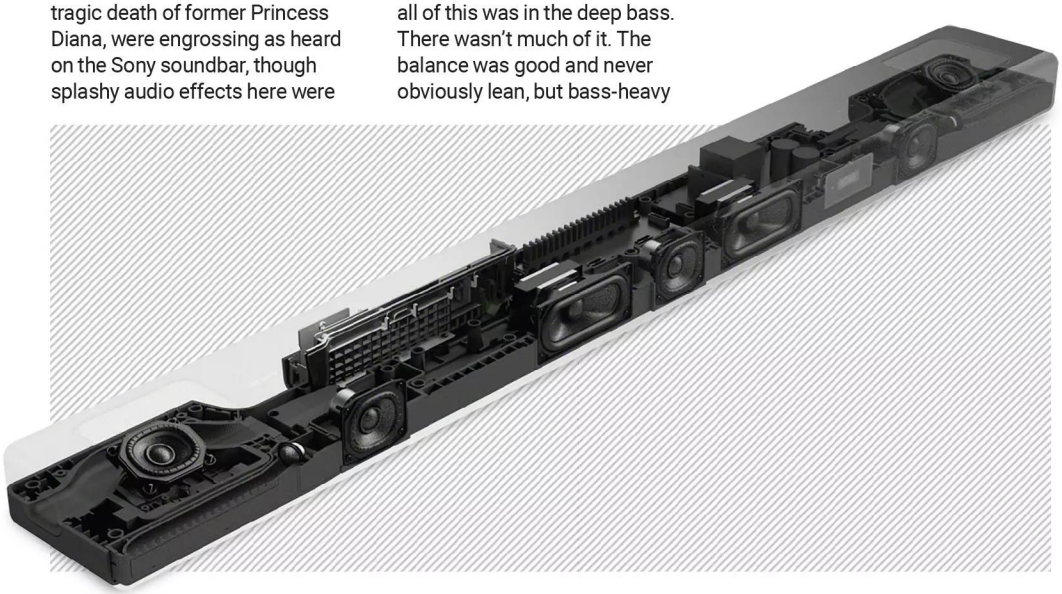
That said, however, all of the best programming I sampled on YouTube ranged from very good to excellent. In one evening's stretch I listened to a beautiful soprano singing Shubert's *Ave Maria* and backed up by a full symphony orchestra at an outside concert in Germany, a female artist pounding out *The House of the Rising Sun* while standing at an electronic piano, a full orchestra playing selections from *Phantom of the*

Opera, the four-piece Prague Cello Concerto also playing *Phantom of the Opera* (though in a very different style and a more reverberant venue), and German tenor Jonas Kaufmann singing (what else!) Nessun Dorma. The audio was so involving on all of these that I was never tempted to jump quickly from one selection to the next, but rather savored each of them intently.

Shifting over to Netflix, I watched the four most recent chapters of *The Crown*, the endless British biopic on the reign of Princess and later Queen Elizabeth 2. These episodes, covering the last months and tragic death of former Princess Diana, were engrossing as heard on the Sony soundbar, though splashy audio effects here were less evident than I had hoped for. And I do confess to a bit of fast forwarding to skip over some of the soapy parts that filled a good bit of the episodes' total 4-hour running time.

I also watched all of another intriguing Netflix series, *The Last Czars* covering the reign and ultimate murder of Czar Nicolas II and his family. OK, so I'm a history buff, but both the video and, more to the point here, audio presentations, were first rate. And on both of these selections the music scores filled in nicely for the general lack of over-the-top effects.

The only obvious limitation to all of this was in the deep bass. There wasn't much of it. The balance was good and never obviously lean, but bass-heavy sources such as *Blade Runner 2049* lacked the oomph (sorry about the technobabble) I know is there. But I did prefer the middle position of the remote control's three-step bass setting; the high position sounded bloated, particularly on voices. The overall sonic balance was never distracting, but if the bass extension isn't enough for you, Sony's optional subwoofer (again, not tested here) might well help, as also might placing the TV and soundbar a bit closer to the wall behind them (roughly 4 feet was the best I could manage). And the room, of course, always has the final say in bass extension.



All of the above-mentioned sources, and others as well, were listened to in Bluetooth. Did I hear any audio quirks I could blame on the presence of digital compression on any or all of them? No (OK, there go my audiophile bonafides!). I also listened to sources using the direct Blu-ray connection mentioned earlier, with Bluetooth turned both on and off and heard no difference. I suspect that the direct link (here using a Blu-ray player) isn't subjected to Bluetooth, whether the latter is either on or off. I ultimately left Blu-ray on for every audio-video source I auditioned with no reservations.

CONCLUSIONS

The HT-A5000 is easily the most complex A/V product I've ever reviewed. One look at its three intimidating manuals might leave you gasping (the *Startup Guide*, the *Operating Instructions*, and the 166 page *Help Guide* are all available for download if you'd like to see them prior to making a purchase decision). To be sure, Sony has taken a mighty stab at providing on-screen setup guidance. It helps, but if you're a consumer who tosses owners' manuals into a dusty corner without ever looking at them this might not be your soundbar.

So, my final words on the Sony HT-A5000 must be tempered by both its setup and operating complexities. But my enthusiasm definitely extends to the final result: the sound. Used within its output limitations, in an average-sized (not palatial) living space and at a reasonable listening distance, the Sony HT-A5000 soundbar easily eclipsed the sound quality of any television I've yet heard.

The Verdict

The detailed setup and operation of the Sony HT-A5000 soundbar can be a little off-putting, but its performance doesn't disappoint and offers a dramatic upgrade over the on-board sound of virtually any television.

OPTOMA UHD335STX SHORT THROW PROJECTOR

Focus on Gaming

By Michael Hamilton

RATING

PERFORMANCE ★★★½☆

FEATURES ★★½☆☆

ERGONOMICS ★★½☆☆

VALUE ★★½☆☆

OPTOMA BOASTS of being both the top 4K UHD projector brand globally and the number one Digital Light Processing (DLP) brand in the United States for 2022, citing the PMA Research Worldwide Projector Census, making the company no stranger to the world of projected light.

Hopes for continuing that streak and contributing to this year's DLP tally is the Optoma UHD35STx, a short throw design that when operational, does not fit the mold for projector placement, at least in the traditional consumer sense. So where and how does Optoma anticipate the UHD35STx will slot into the marketplace? I have a hunch...

THROWING LIGHT AROUND

Currently, a growing and widely accepted trend positions Ultra Short Throw projectors directly below a specialized screen (ideally) and by design aims the lens upward at a sharply raked angle, scarcely more than a foot from the wall. This makes for a (relatively) simple installation, consolidating wiring to a localized minimum. In long throw guise, and what is considered a traditional projector, the image is pitched from across the room, often twenty feet or deeper, with the lens perpendicular to the screen.

Unless pre-planned during construction, one caveat is high-voltage wiring is seldom available unused in ceilings or high on walls, making the task of supplying power and signal cabling to a long throw projector far more cumbersome for the unambitious. The UHD35STx, and its unusual, specified throw ratio of 0.5.1, poses a different challenge if a "clean" permanent room arrangement is desired installation-wise.

Optoma includes a useful backlit remote with dedicated function buttons.

DESIGN, FEATURES, AND CONNECTION OPTIONS

Somewhat diminutive in stature at 12.4" x 10.63" x 4.65" (W x D x H) and conveniently portable with a weight of only 7.72 lbs., the UHD35STx is neither over nor under-styled, perhaps simply described as utilitarian. A (mostly) gloss white is the only available color, always a minor criticism of mine when a unit will remain prominently in the line of sight when operational, to annoyingly reflect screen content from its casing.

For ceiling mounting white makes sense, however, the UHD35STx's short-throw ratio, described in more detail below, forces the unit into hovering well forward of a conventional seating area, at very near the top of the viewing surface. This would appear largely unorthodox in residential settings, almost classroom-like. While capable of it, I do not envision this machine to be affixed to ceilings with any frequency.

The seemingly oversized lens dominates the otherwise plain front fascia, set back into a slightly sculpted recess, well off-center to the right side of the chassis when looked at from the front (something to keep in mind when interfacing the projected image with the screen – center the lens to the screen, not the projector chassis). There are a host of correctional setup features including zoom, image shift, and geometric corner adjustment, however, the best practice is to physically position any projector as best as possible and avoid all digital Band-Aids.

The only interruptions to the front's spartan appearance are an IR receiver at the one o'clock area outside the lens recess, and to the extreme left, the beginning of the series of ornate louvers for exhaust fan ventilation.

While effective for heat extraction, this area inadvertently allows a significant amount of leakage from the 3600 lumens lamp and the pixel shifting, 4-axis, 0.47 DLP DMD (Digital Micromirror Device) with Xpanded Pixel Resolution (XPR) light engine package.

Recessed into the top, centered over the lens, is a tab-controlled adjustment ring for manual focus. Behind this lies a control and information keypad which emulates many of the key functions found on the illuminated remote control. Three LEDs indicate power, lamp status, and temperature. In normal operation, the power LED is ice blue. All three may flash or remain red to indicate a lamp or thermal issue. A second IR receiver is incorporated into the keypad location.

Input facilities on the rear panel include two HDMI 2.x ports labeled 4K 60Hz, HDCP 2.2 compliant, a Type A USB 5V-1.5A power port that doubles up for servicing duties, a male DB-9 RS-232 port, plus a 12V output trigger. Audio provisions include a 3.5 mm analog audio output jack, a S/PDIF digital port, and an onboard speaker of unknown size driven by ten nebulously specified watts. Unlike many UST projectors I have reviewed, whose speaker systems and audio quality compete favorably with entry-level soundbars, what you'll hear provided by this unit underwhelms.

SETUP

Something I have found invaluable with UST machines is thumbwheel-adjustable feet that allow 4-way pivoting of the unit without disturbing placement. With feet merely screwed into the bottom, the moment occurs when perfectly matching the image to the screen border necessitates lifting the machine to access a foot, and invariably, you are nearly forced back to square one. With the UHD35STx positioned three to four feet away from a screen, the shimmied, millimeter movements do not render as wide of an error as with UST devices, but the process remains unnecessarily painstaking and frustrating. As mentioned, precise physical setup negates punitive digital corrections.

Like many projectors designated as "highly portable", menu adjustments for wall color exist for use minus a screen. In an emergency there may be a pragmatic benefit, however, I see a teen taking the unit to a friend's for gaming, pointing the PJ at a wall, and likely not even giving a thought to those options. Even a color scientist would have to contemplate wall color/RGB image interactions.

An Elite Screens Aeon AR103H CLR is my UST reference screen. I favor how the microstructure of its serriform optical light-rejecting surface delivers truthful, flawless performance from the UST genre of devices reflected off the StarBright CLR material. I have detailed the screen design elements for a particular reason, as you will see a bit further below.

Using Optoma's excellent online projection calculator for the UHD35STx (and I mean truly superb – in my opinion, the best projector distance configuration tool devised) the throw ratio for my 103" diagonal, 1.78:1 Aeon designates the lens to be 44.53" from the screen surface, with the center of the lens offset (below the bottom of the reflective material) at 5.15". The UHD35STx was placed on a small table at that distance, with a bit of vertical help to match the offset.

During an interim wear-in period of 100 hours in ECO mode for the lamp, as I monitored the image, I continued to make visual preference adjustments to the Optoma on the Aeon CLR, arriving after a few weeks at Eco+ for the Brightness Mode setting, with Brightness set at -10 to get a better semblance of black in darker image areas. I reduced Color saturation to 32, and in the Color Settings Menu, left Brilliant Color™ at 10, reducing RGB green gain to -10, and blue to -25. These were not calibrated settings, only corrections made by eye to achieve realistic facial hues and a natural-appearing image the way a reasonably knowledgeable user, minus calibration gear, might acclimatize a video system.

SCREENED ON THE SHOT

I first tried the Optoma with my UST screen, as the thought was to review it as front-facing, floor-mounted, but with a UST screen, to determine if such a combination was viable for consumers. It may not have been precisely in the wheelhouse of the Aeon screen, but it met a good deal of the criteria due to placement. However, even with its 3600 lumens rating, the UHD35STx didn't particularly generate the picture "*pop*" as this screen does with various UST machines. Viewing the Formula 1 Belgium Grand Prix, under a cloud-dotted but uncharacteristically dry blue sky, the normally effervescent SKY Sports 4K to ESPN 720p transcoding came across as somewhat restrained with colors muted.

As alluded to above, the screen's microstructure is designed to collect light from immediately below the screen as it is aimed upward and steers it at the viewer, while the micro-optical lens elements reject unwanted overhead light. With the UHD35STx and its lens positioned at the bottom of the reflective surface, while the trajectory of light leaves the lens in an upward path, the incident angle of reflection generally illuminates the screen but a fair amount of light is also simultaneously absorbed in the manner that the screen would do with ambient overhead light. The subtraction takes its toll.

At a Glance

- \+ Bright image with proper screen pairing
- \+ Low gaming lag
- \+ Portability
- \+ Quiet Operation
- − Placement woes with short-throw lens
- − Throw-away audio
- − Manual Focus
- − HDMI 2.0 only
- − Ineffective CMS

Price: $1,749

GAME ON, BUT A LOT OF OTHER STUFF OFF...

During the F1 summer break, what's a, ahem, kid to do? Why, EASports™ *F1* 23 on Xbox ONE, naturally. I took a few laps in User mode, and then measured for lag using a Murideo SEVEN 8K generator. Lag was noticeable in 4K/30Hz, measuring 52ms. Switching the Enhanced Gaming mode to On, lag all but went away, and at 4k/60Hz, it locked in at 17ms. When selecting this mode, however, items on this menu page were grayed out and inaccessible, including Aspect Ratio, Zoom, Image Shift, and Geometric

Test Bench

For measurements, I used a Labsphere USRT-99 Spectralon Reflectance Target placed on a tripod directly in front of the screen center. (Many screen manufacturers use Labsphere targets as a baseline parameter for a color-neutral, Lambertian reference with 99% reflectance at any measurable angle.)

The UHD35STx was a bit of a calibration puzzle. The Color Management System was often more deleterious to the final result than contributory and was best left at default. I only adjusted gain and bias, and in those areas, it felt unnatural to adjust all three bias color channels. On flat panels, I never touch bias, and for gain, I always leave one channel as an "anchor". The rest is typically handled perfectly with multipoint correction. Whether on the Labsphere, the Elite Aeon CLR, or the Elite Prime Vision ISF ChromaWhite ISF, the UHD35STx demanded some finagling to make a marked improvement. With grayscale, the results were acceptable, though they played havoc with gamma. Having features like Wall Color and the portability aspect, this model may not prompt many calls to calibrators.

The results below are on the Elite Screens Aeon CLR 103, the original target of the review. With CMS essentially ineffective, other than the white point, all primary and secondary colors missed their targets with a substantial degree of luminance errors.

Without an iris, the only means to control light output is through mode selection. With a rating of 3,600 lumens, reducing contrast reduces dynamic range.

Display Mode	**User**
Wall Color	**Off**
Dynamic Range	**Auto**
Brightness	**0**
Contrast	**0**
Sharpness	**10**
Color	**32**
Tint	**0**
Gamma	**2.4**

Color Settings

BrilliantColor™	**10**
Color Temp	**D65**
CMS	**Default**

RGB Gain/Bias

Red Gain	**0**
Green Gain	**-7**
Blue Gain	**-17**
Red Bias	**-10**
Green Bias	**-8**
Blue Bias	**-6**

Color Space	**Auto**
Brightness Mode	**Eco+**

Aspect Ratio	**Auto**
Zoom	**0**
Image Shift	**None**
Geometric Correction	**None**

Correction. I had not used any digital image corrections, as mentioned above, however, I intentionally adjusted the last three to excessive settings to verify whether they changed when Game mode was selected. Indeed they do...something to keep in mind if they are required for, say, an adventurous ceiling mount setup. Game mode, though, does not change colorimetry settings. Gaming is bang on with the UHD35STx, totally complaint-free (well, the audio is wholly anemic, but pick your poison).

CALIBRATION

I measured the light coming directly from the lens and off of my Spectralon Lambertian reflectance target placed directly in front of and against the screen, comparing it to the full-field white pattern coming from screen center (see Test Bench for more details). Off the Spectralon, the calibrated image was 85.7 foot-Lamberts (ft-L), and from the Elite Aeon CLR, it was massively reduced to 13.3 ft-L, illustrative of how the light not striking the Aeon's material at the correct incident angle was being tamped down.

I moved the unit to an Elite Prime Vision ISF with EPV's ChromaWhite ISF material, perhaps a more congenial pairing for the front inclined, short-throwing, UHD35STx. I tuned in to a Tampa Bay Rays game from indoor Tropicana Field. Having attended numerous games, as "*The Trop*" is barely a mile from my office, I know how the beige-colored dome creates a difficult-to-get-accustomed-to atmosphere. On the Prime Vision ISF, however, the game was as easy to watch as any outdoor contest. The Rays' uniform details boldly stood out with the prominent blue TB logo splashed across the screen in close-ups. While this review is not about screens, as important as they are, keep in mind that the Elite Aeon CLR is not designed for front projection and the takeaway should not be that it underperformed. It did what it was designed to do, just as the ChromaWhite ISF would have a similar less-than-optimum effect with a UST projector, bouncing the light toward the ceiling and not at the viewer.

A brief look at HDR10, courtesy of Hulu's *Only Murders In the Building* season 3 finale, demonstrated what a generous amount of lumens compared to other similarly priced projectors does to enhance the viewing experience. Black level was not rendered flat-panel deep on the ChromaWhite ISF, as with other units it has been paired with, as calibration measurements confirmed. As described in Test Bench, the UHD35STx yielded substantial grayscale improvement with calibration, but Color Management System adjustments proved futile.

CONCLUSION

So where does the Optoma UHD35STx lay claim as its playground? As I mentioned above, placed on a stand almost four feet from the screen wall, as the HDMI cable and power cord serpentine across the carpet from another cabinet filled with equipment, the look does not bode well for the spouse acceptance factor or to be tolerated long-term by anyone.

Additionally, the short-throw design may not be the ideal candidate for permanent mounting compared to other Optoma offerings. For the price, it might better serve as something teens tuck under the bed when not in use, pulling it out to aim at a blank wall for fighting off dragons and blowing past Ferraris, or with its compact size, toting to a pal's house. With a fair amount of light leakage through the heat extraction louvers, less than ideal black level for a dual-purpose projector, and merely acceptable calibration performance, the UHD35STx will underwhelm cinematically on movie night, and if that is its sole purpose, other Optoma options will serve you better.

But hand one to your kids and tell them to have fun, and from strictly that perspective, I'm guessing the low game lag and the large, bright image will garner two paddle-pressing, school-aged thumbs up.

The Verdict

It may be difficult to wrestle it away from the kids when they are gaming, however, for serious movie watching, that may not bother you. Big and bright for gaming, there are better options from Optoma for Cinema-centric viewers.

TEAC UD-701N NETWORK PLAYER & AP-701 POWER AMPLIFIER

SOUND & VISION TOP PICK

RATING

PERFORMANCE ★★★★★

FEATURES ★★★★½

ERGONOMICS ★★★★½

VALUE ★★★★½

Worth the Splurge?

By Daniel Kumin

AS A RULE I'm not particularly susceptible to the "audio-jewelry" school of component design; I'm a value/performance guy. But I have to allow that Teac's new 700-series components—the UD-701N Network Player and AP-701B Power Amplifier—have a decidedly seductive vibe. They're compact but dense, beautiful and beautifully finished, and they sound fabulous.

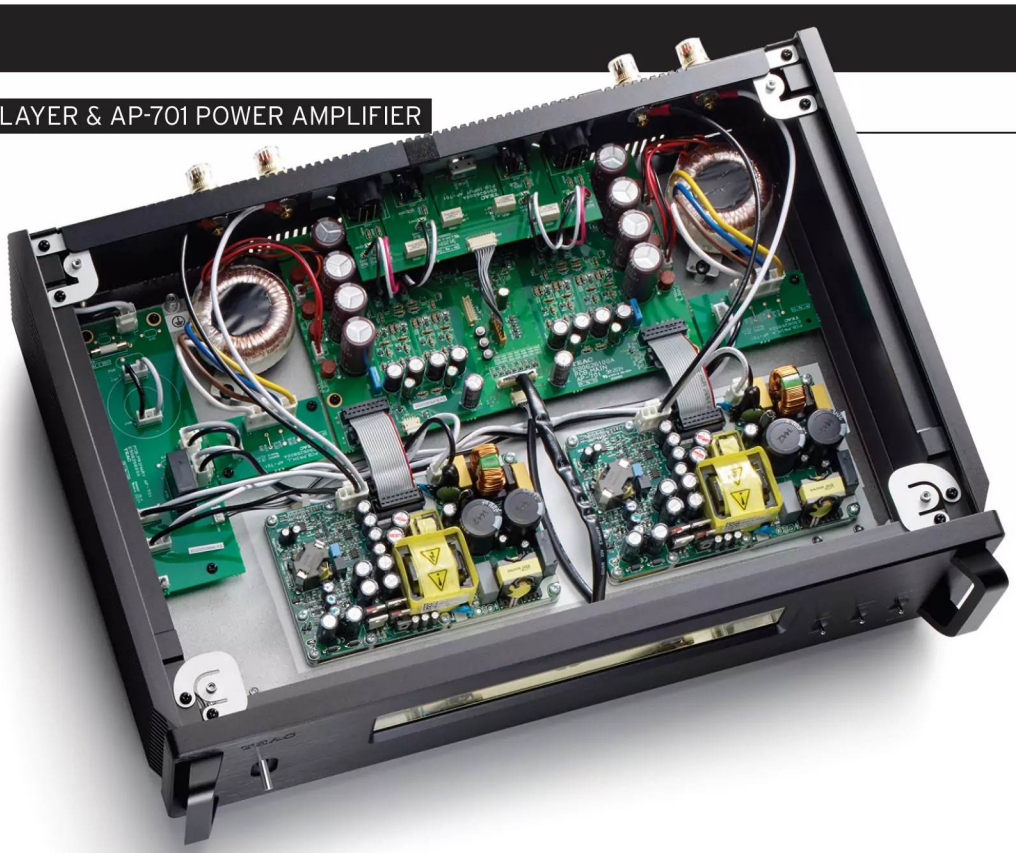
Japan's Teac (more correctly "TEAC") has had several incarnations in the U.S. audio marketplace of the past half-century or so. The firm, which arose from the Tokyo Electro-Acoustic Company, came to prominence here with its affordable, multitrack open-reel (and later, cassette-based) tape recorders, which made studio-like, multi-instrument home recording widely available for the first time, in 1969 and throughout the '70's. (Early adopters included Bob Dylan and The Band, at their famous "Big Pink" basement studio in the Woodstock, NY area, while a decade later Springsteen's "Nebraska" was famously recorded on a Teac multitrack cassette system.)

In the mid '70's Teac, with Sony and Philips, launched the Elcaset, a giant-sized enclosed-tape format that promised open-reel performance and flexibility with cassette-like convenience. Sadly, like all too many other examples of technically superior engineering, it launched, bubbled briefly, and sank leaving little trace on the collective audio memory. Teac then became an important purveyor of compact integrated music systems, first cassette- and later CD-based, which came to be called "midi" systems. Finally, in the late 20th century and into the current one the firm morphed into an unabashedly high-end audiophile brand, with limited-production separate components under both its own and its Esoteric names.

The 701N and 701B, as I'll call them, are examples. The former is a network-streaming preamplifier; the latter a stereo power amp based upon nCore Class D modules from Netherlands' Hypex. We'll start with the power amp, by far the simpler unit. The rear panel presents a spaced pair of heavy, "WBT-type" banana/5-way jacks for each channel, a balanced (XLR-female) and unbalanced input (RCA) ditto, 12v-trigger in and through minijacks, and an IEC power-cord receptacle. A mini-USB port is labeled "Software" (though it's hard to imagine what software update a power amplifier might need), and mini-slide switches labeled Output Mode Stereo/Biamp, and Auto Power Save On/Off complete the facilities.

Teac's UD-701N Network Player and AP-701B Power Amplifier: A fusion of compact elegance and high-end audio performance, showcasing classic minimalist design and intuitive controls.

The amp's front is dominated by a gorgeous, beveled-window, amber-lit dual-meter, marked in dB. One of three adjacent toggle switches, also handsomely beveled-in and possessing crisp, positive action, sets meter



sensitivity to 0/+20 dB or off; its neighbors select meter brightness and the rear panel's balanced XLR or unbalanced RCA inputs, while over on the left is a much larger but equally solid-feeling power-switch toggle. The front panel is elegantly brushed, its integrated handles elegantly sculpted, and the side-panel heatsinks elegantly radiused, so elegant's the word all around.

Which carries over to the star of the pair, the 701N "USB DAC/ Network Player," where we see the same brushed finish and handles, complemented by a pair of knobs, the larger Volume, the smaller Source (with a push-to-enter function), that exhibit the gooey-smooth action we expect in high-end gear. Menu and Output pushbuttons, and a power toggle identical to the amplifier's complete the controls, while the small, amber display between the knobs provides basic visual feedback. There are two headphone outputs: a conventional 1/4-inch stereo, and a four-pin DIN balanced jack.

Around back the 701N is busier, with balanced (XLR) and unbalanced (RCA) inputs and outputs, paired optical and coax S/PDIF digital inputs, and both USB-B (streaming) and -A (drive) ports (another mini-USB port, for firmware updates, is marked "Software." There's also a wired-Ethernet network port, of course, plus an RS-232 serial port for a system controller, 12v trigger in/ out minijacks, and a Bluetooth antenna bump-out.

The supplied remote controller is unremarkable but complete, with direct-access input keys, and volume/mute at least segregated for easier thumb-location. Notable remaining keys include Upconvert, Filter, and Headphone, all of which we'll get to. Oh — and the handset was equipped with AC/Delco AAA batteries. Who even knew Delco made these? Not this guy.

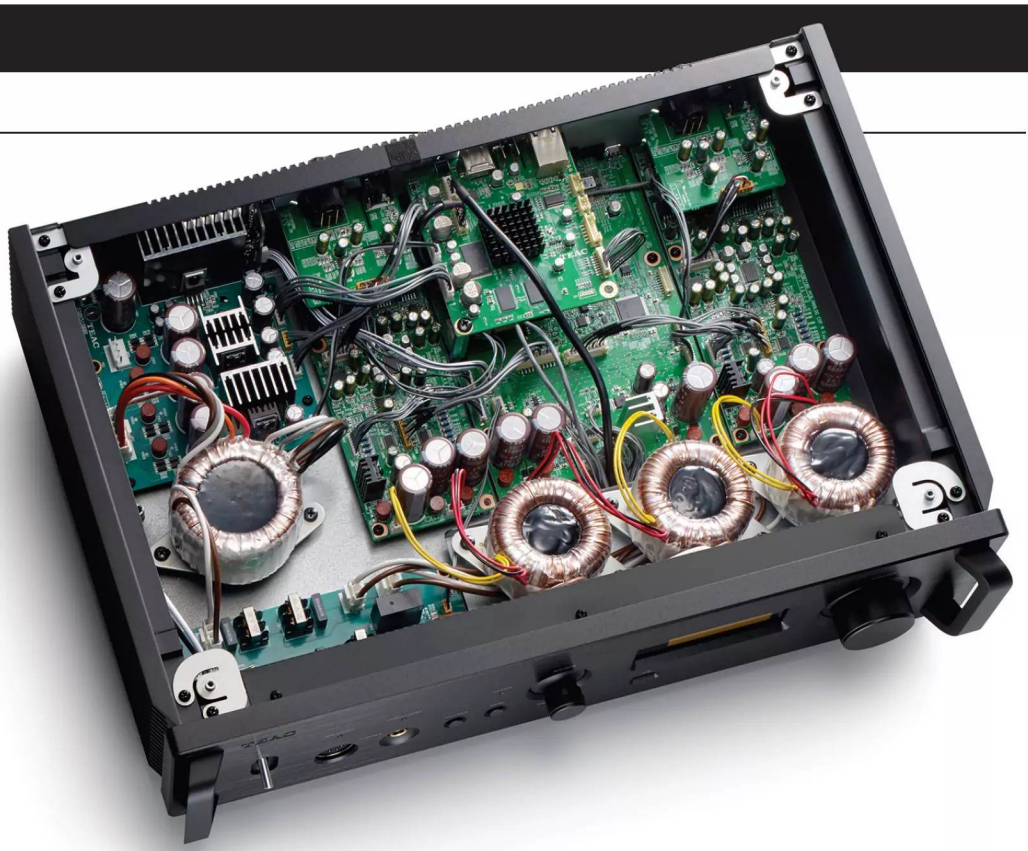
SETUP & LISTENING

After placing the very hefty Teacs on my rack, setup consisted of nothing more than plugging in my sources, and speakers. (Both units feature de-coupling tripod feet. These seem disconcertingly rattly at first, but I trust Teac's vibrational engineering.) I employed a pair of high-quality mic cables to connect the Teac pair in balanced mode—even though I generally consider balanced connection unneeded in short-run consumer settings—because I could. Sources included a CD/SACD player/transport, an outboard DAC (unnecessary, of course, but I wanted to try the 701N's analog ins) and an Ethernet cable to my rack's network switch.

Loudspeakers, fed by heavy, banana-terminated cables, were my usual stand-mount, three-way monitors, a very high-resolution, nearly full-range design from Canadian maker Energy (now a part of the Klipsch Group and not as high-end-focused) that, while long discontinued, are competitive with most anything similar made today. They earn their keep in my studio by presenting a stable but moderately demanding electrical load, with quite low sensitivity that imposes a fair challenge to power amplifiers without (I hope!) risking hearing damage.

My primary everyday music source is Roon software, which correctly recognized the "Roon-Ready" 701N and was ready to play off the hop. (I also streamed content "direct" via Teac's app, from Qobuz and Tidal.) The first track I happened upon was the R&B classic "Shaky Ground" from surprising folky-turned-soul-singer Phoebe Snow, from a 2008 live session. This presented with rich detail, forceful dynamics, and a generous soundstage. And indeed, these were the hallmarks of most everything I auditioned via the Teac stack.

Its maker reports the 701N as incorporating a newly designed, proprietary digital-to-analog converter subsystem. This is said to be a delta/sigma (so-called "one-bit") design built of a discrete-component "ladder" circuit controlled by field-programmable gate



arrays—FPGAs—capable of PCM decoding up to 384 kHz/32-bit, and DSD up to 22.5 MHz (This kind of thing is fairly hot in the digital-audiophile world currently.) None of this jargon guarantees any sonic virtues, of course, nor disputes the fact that chip-DACs of similar capabilities and near-perfect specs and measurements are available from popular sources such as AKM for a few dollars each.

But Teac thought it important enough to spell out in its marketing materials, and while I don't believe that data bits have memory (they don't "care" what circuit topology they pass through), I can, and will share that my system has never sounded better. A sweeping trial like the brilliantly produced Mahler Fourth from the San Francisco Symphony under Tilson-Thomas (Qobuz, 96 kHz FLAC) sounded magisterial, with a easily discerned depth to the orchestral soundstage, and the kind of effortless clarity of inner voices that I am convinced that only truly full-resolution playback delivers. The clarity with which it presented Mahler's numinous orchestration (and the Frisco-ans performance) kept me glued to my seat for full movements.

The rather astonishing *ur*-Streisand recording, *Live at the Bon Soir*, was just as riveting: not so much for the recording of the backing quartet, which is a bit flat and uninteresting, but for the hypnotic immediacy of *that* voice. Through the Teac system I could at one and the same time succumb to the spell of the superbly "right here, right now" vocal sound on a tune like the Arthur Hamilton standard "Cry Me a River," yet still note the "moving parts" behind the recording: the slight squeezing of The Barbra's chest-tones range, and the equally slight but still obvious compressions and coarsening of the sound when she reached the upper end of her dynamic range in the higher octaves (presumably, compression occurring in a tube-mic, or tube mixer, or something). Now *that's* resolution.

How much of this excellence should be awarded to the head end of the Teac twins, and how much to the power amp is difficult to say. I've heard many, many a power amp built upon Hypex modules, and have without exception been impressed by their power, dynamic exactitude, and transparency. The Teac is no exception; the firm claims proprietary power-supply and input-amp sections (as do many other Hypex users), but whatever the case, the 701B, which is rated for 125/230 watts into 8/4Ω — conservatively, I'd warrant — had no difficulty driving my low-sensitivity monitors to fully lifelike levels on any music genre I tried. I never once heard it clip, coarsen, or exhibit any sort of audible misbehavior whatsoever.

Briefly: Teac claims careful design and execution of the 701N's headphone output, a dedicated circuit section. I have three excellent-resolution sets to try: an easy-to-drive but low-sensitivity planar pair, a harder-to-drive (lower impedance) dynamic pair, and, recently, a set of the astonishingly good, ridiculously easy-to-drive (and ridiculously affordable: $22!) 7hz Zero IEMs. Each one sounded as fine as I've experienced: ultra-clean, entirely dynamically uninhibited, and sparklingly high resolution. (I auditioned all in two-wire, unbalanced connection mode.) If headphone listening is an important part of your audio jam, with the Teac pre/streamer you can confidently dispense with a separate HP amp.

THE OTHER STUFF

Teac's supplied remote is unfancy but complete and functional, though a bit short on ergonomic refinement: its 22 identically shaped and -surfaced small buttons are laid out to visual, but hardly tactile logic. Nevertheless, this gives hands-free access to virtually all the 701N's features and functions. Teac HR Streamer app, which I sampled in its iOS form (Android is also available), does the same, with the addition of direct access to music-library files (if present on your local network), and to Qobuz, Tidal, and

TEAC UD-701N NETWORK PLAYER & AP-701 POWER AMPLIFIER

Spotify subscription services, and to free Internet-radio streams via TuneIn. The app, too, is functional, with access to all the 701N's features and functions, but its design is frankly, rather crude, with the look and feel of a "my first coding project" creation. It was also a bit unstable, crashing a couple of times - at least, as running on my admittedly aged iPhone XS — for no apparent reason, but always leaving the music playing undisturbed, and re-launching without complaint. There's also a similar free application, Teac HR Player, a free download for both Mac and Windows from Teac's website, but I failed to induce the Mac version to recognize the 701N.

Three 701N features require a brief foray into digital-audio arcana. "Upconversion," accessible from the front panel, remote, or app, allows you to choose among 2x, 4x, 8x oversampling for incoming, un-oversampled PCM data; "filter" sets the DAC's "extra" anti-aliasing filter, when in DSD mode, to one of two modes (I could find no discussion of these anywhere in Teac's materials). Anyway, while I tried manfully to detect meaningful effects from these, it was only on headphones, and only on the Upconversion option, that I may have succeeded. Though what the changes were, I'm damned if I can say: a barely detectable (or not?) shift in "texture" or "density" of ambience and background noise is about as close as I can come. The 701N also proffers a Clock-Sync input, for slaving its DAC to an external clock — this is mostly a recording-studio fetish — but I had no external clock source on hand so was not able to exercise it.

I briefly tried the Teac's Bluetooth input, and it sounded okay. This is equipped with aptX-HD codec readiness, but my phone and iPad are not. A higher-rez BT source would no doubt have yielded something a bit better. Similarly briefly, the 701N's analog input, serving my external D/A converter, sounded as good as ever. Ditto-ditto the Teac's coax input, fed from my Philips CD/SACD player, the source for my Upconversion adventures.

Lastly, Teac's design can directly decode DSD (SACD format digital audio) files up to 22.5 mHz. I played a handful of my collection of several dozen DSD files, and they sounded uniformly excellent. They always do, but I mention this in the interest of completeness. And again lastly — I mean it this time — the 701N can function as a full MQA decoder/renderer, which it did on the appropriate files I played from Tidal. But given MQA's current limbo (Tidal is busily converting much of its library to lossless FLAC), that's all that needs saying about that.

And there you have it: lovely, high-end, fully audiophile-qualified stereo-audio excellence, soup to nuts: no excuses required. Except for the value question.

It would be disingenuous to omit the fact that you can buy a Hypex nCore-based stereo power amp with on-paper performance equivalent to the 701B's for less — a *lot* less. Similarly, standalone streamers are as thick as sumac these days, beginning with items like the remarkably high-value ($220) WiiM Pro Plus, though finding one with exactly the same feature set as Teac's is going to be tough.

Is the Teac duo "worth it?" Only you can say. Teac's UD-701N/AP-701 twins are intelligently designed, very full featured for their ilk, and beautifully made. And they deliver gorgeous, sumptuous, unimpeachable stereo audio playback. What price you put on these virtues is up to you.

Specs

UD-701N D/A CONVERTER/STREAMER

DIGITAL AUDIO INPUTS: 1 coax, 1 optical SPDIF (16-bit/192 kHz), USB-B (16-, 24-bit/to 384 kHz, DSD to 22.5 mHz; 2 USB-A for storage device (1 front panel), 1 USB-B/streaming; Ethernet (to 32-bit, 384 kHz/22.5 mHz DSD)
ANALOG INPUTS: 1 balanced/XLR, 1 unbalanced/RCA ; audio outputs: stereo, 1 balanced/XLR, 1 unbalanced/RCA; Headphones: 1 unbalanced $^1/_4$"-stereo, 1 4-pin XLR balanced
Dual selectable (front panel) stereo speaker outputs (multiway binding posts), pre-out (preamp output: linked to main-in), mono subwoofer out at fixed 80 Hz low-pass, headphone (1/4-in. stereo, front panel)
NETWORK: Bluetooth aptX HD, wired gigabit Ethernet (streaming); on-board streaming: Spotify Connect, Tidal Connect, Qobuz, TuneIn
DAC: 32-bit/384 kHz-capable proprietary delta/sigma, dual-mono config.
ADDITIONAL: 12v trigger in/out, RS-232 serial port (control)
DIMENSIONS (WXHXD, INCHES): 17.5 x 4.5 x 13.25, 26.2 lb.

AP-701 STEREO POWER AMPLIFIER

ANALOG INPUTS: balanced/XLR, unbal/RCA
POWER OUTPUT: 125/230 watts x 2 (8/4Ω) at 1% THD at 1 kHz (manuf. publ. Spec.)
THD: 0.003% (at 55W at 8Ω at 1 kHz
12v-trigger in/out on minijack
DIMENSIONS (WXHXD, INCHES): 17.5 x 4.5 x 13.775 in., 21.8 lb

Back View: The UD-701N and AP-701B rear panel connections, integrating advanced technology with user-friendly accessibility.

The Verdict

Jewel-like stereo separates deliver definitive stereo audio performance.

The Moody Blues suit up for the Future task at hand.

PASSED, PRESENT, AND FUTURE

How The Moody Blues co-created the hybrid music genre known as orchestral rock by going all-in on making their groundbreaking audiophile-favorite masterpiece, November 1967's *Days of Future Passed*.

BY MIKE METTLER

THE MOODY BLUES had no choice but to take a huge gamble as the calendar turned to 1967. While the Birmingham, England-bred band had made an initial splash during the first wave of The British Invasion in late 1964 and on into early 1965 with "Go Now"—a peppy No. 10 U.S. pop-chart hit sung by guitarist/vocalist Denny Laine—they found themselves somewhat behind the curve when forward-thinking songwriting, adventurous composition, and outright psychedelia began dominating the rock milieu in the latter half of the decade.

What was a poor working-class band to do? Personnel issues, financial straits, and other typical growing pains had resulted in Laine—who recently passed away at age 79 in December 2023—and bassist Clint Warwick departing the fold in 1966, paving the way for guitarist/vocalist Justin Hayward and bassist/vocalist John Lodge to enter the Moodies picture alongside co-founding members keyboardist/vocalist Mike Pinder, drummer/spoken-word specialist Graeme Edge, and flautist/jack-of-all-trades Ray Thomas. This staunch five-man outfit would put their collective careers on the line in order to create the cross-genre hybrid concept LP that became November 1967's *Days of Future Passed*, a gutsy album that meshed the band's core pop sensibilities with brave compositional choices. At the same time, Decca, the Moodies' parent record company, was intent on putting out a demo record of sorts on the burgeoning Deram imprint that would champion their recently new stereo-centric audio format dubbed Decca Panoramic Sound—a.k.a. the Deramic Sound System (DSS)—by marrying The Moody Blues' pop/rock sensibilities with classical music elements courtesy the London Festival Orchestra as conducted by arranger/composer Peter Knight.

While rock musicians recording with and playing alongside orchestras is essentially *de rigueur* these days—if not an expected rite of passage for many an artist at this point in the 21st century—it was literally unheard of in the heart of the swinging 1960s. But once *Days of Future Passed* made its way into the public consciousness with truly transcendent tracks like "Nights in White Satin" and "Tuesday Afternoon" leading the way, The Moody Blues never looked back. They capitalized on the tenets of the Deramic Sound conscription by taking a keen interest in forging *exactly* how their music would sound on vinyl—as well as on the then-emerging stereo-oriented component of the airwaves known as FM radio. To do so, they worked closely with producer Tony Clarke and recording engineer Derek Varnals to craft a signature sound that set a tone for how the mostly concurrent quad mixes for the majority of their studio albums released between 1967-72—LPs known as "The Classic Seven"—would become early immersive audio templates. Unlike what happened with a few too many of their contemporaries' quad releases of that era, the Moodies' sound palette actually *broadened* in quad—and

because of their multitrack/multichannel proclivities, their albums were ripe for eventual 5.1 upmixes near the turn of the century as well as a number of subsequent, all-new surround mixes and (we hope) eventual forays into the full-on Dolby Atmosverse at large.

Days of Immersive Futures

It's worth noting the linchpin track on *Days of Future Passed*, "Nights in White Satin," really opened up the Moodies' 360-degree hatch. On the 24-bit/96kHz DTS-HD Master Audio 5.1 DVD version of Days released by UMC/Deram in 2017, mixmasters Mark Powell and Paschal Byrne quite masterfully "manipulated" (in their words) the initial of-era 1972 quad mix done by original producer Clarke and original engineer Varnals into modern 5.1 royalty—and they also did it a full decade-plus following the album's 2006 release on SACD. In 5.1 on the 2017 DVD, the breathtaking 80-second orchestral swell that follows lead vocalist Justin Hayward's final, impassioned "Oh, how I love you" is followed quite pithily by the properly austere, back-channel-only "Late Lament" narration by Mellotron maestro/gong hitter Mike Pinder.

"Tony Clarke and Derek Varnals had done the original quad mix in the Decca studio," recalls Hayward, "so they had exactly the same echoes and whatever else they were able to bring in, even though the desk had been updated. Decca never threw anything away, so they were able to bring in a whole section of the mixing desk—about 12 faders—to get exactly the same EQ and mix on it. For the 5.1 mixes I did with Alberto [Parodi] for our *Timeless Flight* box set, there's nothing added on them except some ambience things in the surrounds." (The Moody Blues' hard-to-find 2013 11CD/6DVD *Timeless Flight* import box set on UMC offers said *Days* surround mix on the DVD designated as Disc 15.)

Hayward remains floored by what he heard of *Days* in surround. "I was just sitting there in the studio with Alberto working on the 5.1 and thinking, 'How the hell did we do this? How the hell was it done?' There's a song on there called 'Dawn Is a Feeling' where Mike [Pinder] got all the Mellotron things *just right*. I can't take any credit for it, because it really was Derek who did it—and I'm *so* glad he did the quad version back then in such beautiful quality since it saved me a lot of time and pain. It was a responsibility I don't think I'd liked to have taken on myself."

Over the course of the passed, er, past 30-plus years, I've had the privilege of speaking with all five of the Classic Seven-era Moodies—two of whom are sadly no longer with us—in addition to their aforementioned quad-leaning engineer. Though The Moody Blues are currently not touring or recording together while the key remaining members Hayward and Lodge pursue their respective solo endeavors, *Days of Future Passed* serves as a career-defining album of great aural poetry that will continue to be enjoyed by scores of fans both old and new alike, long after we're all gone from this plane of existence.

For various reasons, the balance of the Moodies conversations that follow have neither been transcribed nor shared anywhere—until now, that is. Herewith, in their own words, The Moody Blues and their recording team relay the tales behind the impetus for and making of *Days of Future Passed*, one of popular music's most important albums. *Just what you want to be / You will be in the end. . .*

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1) The Moody Blues are one with nature in the 1960s (Hayward is at the far right).
2) Latter-day Moodies, circa 1991; from left to right—Edge, Lodge, Hayward, Thomas.
3) The door of Passed perception awaits (Pinder is second from right).

Peak Hour Performers

DEREK VARNALS (recording engineer, 1967-72): We recorded "Nights in White Satin" that first week of October 1967, and it was going to be the single. It wasn't recorded with stereo in mind at all—it was done in mono, and it was done very much on our third-generation 4-track because we'd gone from one 4-track over to another 4-track and back again, just to create enough tracks to get all the layers on it that we wanted.

And then, within two weeks, the band were brought back to Decca to do an album. The idea was that we were going to make an LP of a song cycle that illustrated a day, and then we'd record another couple of numbers. We'd had a meeting at the head office just before we recorded the next track where it was decided we would use [conductor] Peter Knight because we'd done a similar project with him already, whereby we had layered orchestra onto a rhythm section for [1965's] *Western Heritage*, an album that was inspired by the [1962] film *How the West Was Won*. It had all the typical cowboy songs that would appeal to America, and it was also kind of a continuous play—an episodic kind of thing. The idea of adding orchestra onto a rhythm track by overdubbing wasn't unheard of, and I think that was what inspired the choice for us going with Peter Knight—apart from the fact he's a really good arranger.

Anyway, "Nights in White Satin" was recorded as a mono single, and it came out [on November 10, 1967] about a month after we recorded it. There was this intervening period when [Decca A&R man] Michael Dacre-Barclay must have heard "Nights in White

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Satin" because Tony Clarke, the producer, had brought the acetate up to the head office and was playing it—and it was attracting some attention. I think Michael thought, "Oh, wow, this is a good idea. That sounds quite orchestral. We could grab the band and do both rock group and orchestra on this label together." And then it all took off from there.

It just so happened the theme of *Days of Future Passed* dictated itself because they had a couple of songs already written, like "Dawn Is a Feeling." According to my studio notes, we recorded "Nights in White Satin" on the 8th of October, and the next one we did was "Dawn Is a Feeling," which was on the 18th of October. It was only ten days later, and we were embarking on the album! (laughs) The next track we did was "Peak Hour," which was on the day we met at the head office to formulate it all. That's when The Moody Blues, Tony Clarke, and myself went up to see [executive producer] Hugh Mendl and Mike Barclay and we said, "Look, we've got an album coming together now. There are three songs that cover night, dawn, and the peak hour, and Justin already has 'Tuesday Afternoon' planned, but it's not finished. So, we're going to record a day. That's the theme of the album." And then Michael said, "Well, that would work by having them linked together with an orchestra—and Peter Knight is the man for the job."

We started the *Days of Future Passed* album proper on October 18th, and finished on the 27th. It wasn't done continuously because there was plenty of orchestral stuff in between. All the orchestral work was done as fresh pieces, but we also overdubbed them onto "Nights in White Satin." The orchestra came in for a morning and an afternoon, and we'd done all of it in one day—and then we mixed it within a day or two. It was all done in a rush, and the Deramic Sound feature—the "prescription" that Michael Barclay inflicted on us (chuckles)—was mainly the orchestra having that delayed stereo reverb. It's quite obvious on some of the little tricky staccato violin pieces on the overture—"The Day Begins" opening bit. And then, when it picks up the theme of the Ray [Thomas] song, "Another Morning," you can hear that too. Obviously, the quad [mix] would expose a lot of those subtleties—that's the thing a few people were worried about with quad mixing—but it all works just fine, in my opinion.

A Knight in White Satin

JUSTIN HAYWARD (guitarist/vocalist, 1966-present): I wish that I, along with anybody else in the group, could take all the credit—but we could almost take no credit at all, in truth. With *Days of Future Passed*, we had a bunch of songs that I don't know whether they'd have had success if we'd had a chance to record them for Decca without the whole *Days of Future Passed* concept attached to them—but we were lucky we did. And we were *very* lucky Decca wanted to make that kind of Deramic Sound demonstration album and involve us with it. I can't even say the quality of it, or the way it was recorded, had anything to do with the group at all. That really was just one of those wonderful pieces of luck that put us together with Derek Varnals and Hugh Mendl, the executive producer. They were the ones who put the music in that beautiful stereo picture.

The fact is, *nobody* ever asked us about this stuff in the ten years after *Days of Future Passed* was released, because people just weren't all that interested. We were *never* asked to explain records until you guys came along, Mike! (both laugh) Anyway, I know other guys in the band would say, "Yeah, of course, it was a conscious thing to record it that way," but I have to qualify it by really being truthful in saying we stumbled onto some wonderful people who helped open up our songwriting. Immediately, I could see how my songs worked through Mike [Pinder]'s Mellotron, and the way he was able to bounce backwards and forwards with that way of recording we did with

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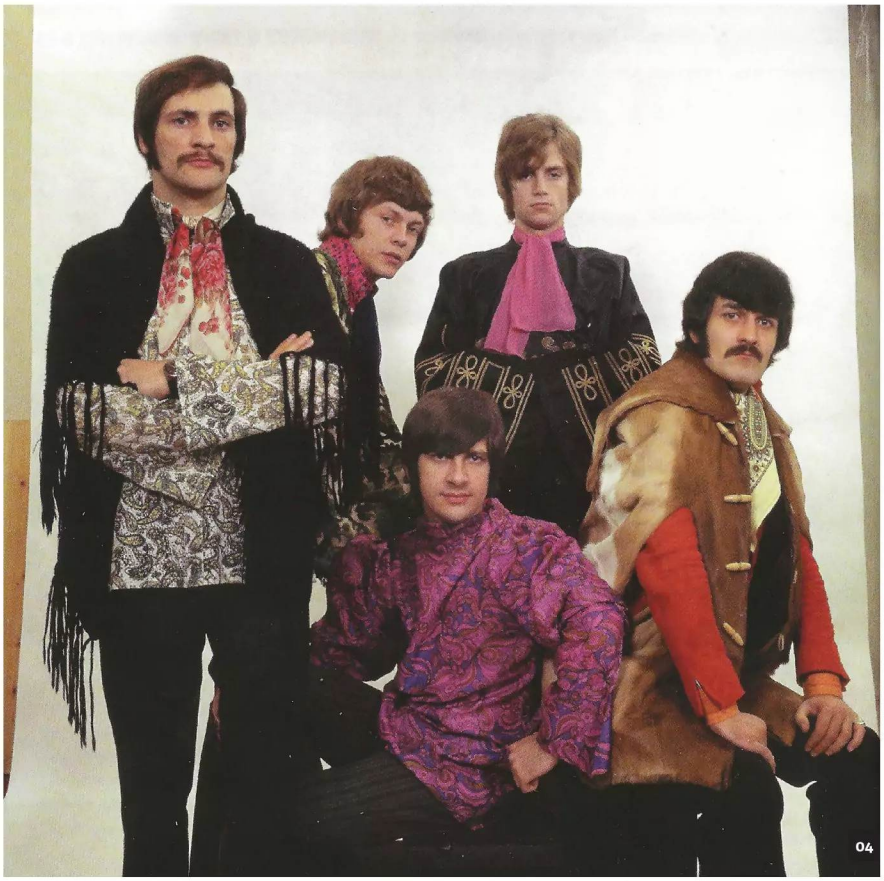


4) The Moodies are resplendent in the garb of the Days of yore (Lodge is second from top left). 5) From left to right, Hayward, Edge, and Lodge, circa 2009. All photos courtesy both Deram/UMC/UMe, and the 2017 CD/DVD.

Derek. The whole thing just *worked*. Having that opportunity with a record company that said to us, "We don't know what you're doing—but people love it, so get on with it." We were all educating ourselves about recording, really, and by the time we got to the third album [May 1969's *On the Threshold of a Dream*], we knew all about it, and we were totally savvy of it—and *then* we started thinking about having our own studio, and how to record things properly. But I still have to say Derek was a *big* part of it. I know when we stepped away from using Derek [after October 1972's *Seventh Sojourn*], it was a completely different feeling. I struggled to get the same electric guitar sound Derek had got.

As to the songs themselves, I didn't really think about the lyrics to "Nights in White Satin" when I wrote them. They were just *there*—sort of random thoughts from a guy at the end of one big love affair and the beginning of another. The same thing with "Tuesday Afternoon"—I didn't really think about those lyrics either. They just happened—and then you're kind of stuck with them, forever! (laughs) But I've always been able to deliver them sincerely, and absolutely, from the heart.

Another interesting thing we found out when Graeme [Edge], John [Lodge], and I were touring together was, we were very lucky to be the three guys in the band who had the pleasure of revisiting songs we had only worked on for a day or two, or maybe three, in the studio. Those were the times when groups weren't really invited into the control room until you'd done several takes, and *maybe* they'd ask you to comment on a particular take. It was only a couple of years later I started to know I could do it myself.

Evening Time to Get Ahead

JOHN LODGE (bassist/vocalist, 1966-present): I've come to realize *Days of Future Passed* has brought me to where I am today, and that's why I've called my [2023] solo album *Days of Future Passed–My Sojourn* because it *is* my sojourn, you know? (laughs heartily) That album is such a huge part of my life and a huge part of a lot of other people's lives—people who are Moody Blues fans who've come to love *Days of Future Passed* after all these years, some of them not knowing it was probably released before they were even born! (laughs again)

I remember when we had the playback for the Decca record company executives and A&R people. They certainly didn't understand it, and I *know* there was a rumor going around saying, "How are we going to sell this?" (chuckles) The great thing was, we had two people there—one was the head of classical music, Hugh Mendl, and there was also the vice president of London Records out of New York. Those two guys *got it*. All the other people didn't get it—but *they* got it. It was fantastic having these two guys—one in England, and one in America—being our mentors.

Mellotron Is A Feeling

MIKE PINDER (keyboardist/vocalist, from 1964-78): I am really grateful to listen back to this music and feel it stands the test of time. I always wanted to create melodies, counter melodies, and arrangements that connected with people and tell shared stories of our humanity. We all have the same hopes, dreams, and loves. It is the job of the writer to tap into the collective consciousness of the listener with the story interwoven with melody and an orchestral backdrop. We used to have to layer guitar, strings, piano, flutes, drums, percussion, and any other orchestral instruments we wanted with the use of two 4-track machines. We would lose quality as we bounced things down to make room for the next instrument. Mixing often had to be done in the moment.

Tony Clarke, Derek Varnals, and I were always trying to create new and innovative sounds, and I love the surround sound mixes [that came later]. We would have done it at the time if it had been available, but Derek always did a wonderful job with the quad. He was innovative and talented, and he and Tony Clarke were adept at driving the ship. We were all very committed to our music, and it was an adventure—with lots of fun and laughs as well. Everyone worked very hard. We had creative freedom, and we were fortunate to be allowed to try new things. It was our musical wonderland.

The Sun Setter

GRAEME EDGE (drummer from 1964-2018; he later passed away at age 80 in 2021): *Days of Future Passed* was just ten days in the studio—and, I have to say, Peter Knight was great. He was great because he heard our ideas, and he played them properly. He went right along with it, and he put a bit on the line just to work with us. Tony Clarke and Hugh Mendl also put some stuff on the line for us, and they just let us go at it. That was such a great thing back then with the record industry when they had music men in positions of power—it wasn't all business, like it later became. Decca told us, "We think you better set it up, and start working to go ahead and just *do it*."

We had nothing to lose. We were responsible for the content, the vision, and for breaking the rules, but the technical side

of it was all Tony Clarke and Derek Varnals. When we came back to revisit all that stuff later, we discovered how high the quality of the recordings we had made were. It was well beyond the capability of the environment we were in at the time. The needle used to go into the red—but it never hit "stop," you know what I mean? (laughs)

What do I like most on the album? "The Sun Set" [the first section of the song called "Evening"]—I like the desert feel to that one. It all sort of feels like *Lawrence of Arabia* [Edge hums that 1962 movie's theme, which was composed by Maurice Jarre]. And "Twilight Time" [the second half of "Evening," which follows the aforementioned "The Sun Set"]—I always enjoyed that one too, because I like that sort of rock & roll phrase [Edge hums the song's melody]. I've always liked that.

Another Morning Man

RAY THOMAS (flautist/jack-of-all-trades from 1964-2002; he later passed away at age 76 in 2018): When we finished *Days of Future Passed*, we invited The Beatles over to have a listen. John [Lennon] and George [Harrison] were at our house a hell of a lot when we all lived together in Roehampton [in southwest London]. We really loved each other's work, as it was all so different.

We said to them, "We've just finished this big piece—what do you think of it?" Now, *Days of Future Passed* isn't like *Pepper* [a.k.a. *Sgt Pepper's Lonely Hearts Club Band*, The Beatles' seminal album released on June 1, 1967]. I mean, *Pepper* is like a show—but *Days of Future Passed*, I think, was really the first concept album with a beginning, middle, and end of a concept that was cohesive.

Late Laments: Final Words

MIKE PINDER: There is always room for an array of musical talent, from The Beatles to The Moody Blues. We were all musically varied in our approach. It was not a homogenous, one-size-fits-all musicality.

GRAEME EDGE: Do I think *Days of Future Passed* material will continue to be spoken, sung, and performed 50 years from now? No, I don't think about it too much, because that way lies to a bloated ego—but, yes, that album set a template for something that had never been done before. We didn't know it at the time, and I think it's an example of "ignorance is bliss." If we *had* known how impossible it was, we wouldn't have done it! (laughs heartily)

RAY THOMAS: We've had *Days of Future Passed* covered in reggae, by concert orchestras, and even rap. But with [2004's] *Moody Bluegrass: A Nashville Tribute to The Moody Blues*, they really gave it a bluegrass feel—and I was over the moon with it! I sent one of the guys a little parcel, and in the parcel was a tiny silver flute in a case with a note that said, "This is the only thing that's missing." When it came time for them to do Volume Two [2011's *Moody Bluegrass TWO...Much Love*], they decided they were going to do "Dear Diary," which is one of my songs [from May 1969's *On the Threshold of a Dream*]. They said, "Would you put the flutes on it?" They sent the backing track over, and I went in the studio and did it. Fortunately, it was in the same key as I'd written it in (laughs), which helped. It knocked me out to do it because I thought, "Well, I'm the first rock & roll flute player, and now I'm the first bluegrass flute player!" (laughs again)

DEREK VARNALS: It was obvious "Nights in White Satin" was a special record—and certainly by the time we were doing the voices for it, I realized this was a bit more than just a ballad number. The *Days of Future Passed* album was quite complicated to make with the orchestral overdubs—which were unusual—and the difficulties the Deramic Sound prescription gave us engineers. It was all out of the ordinary. There are loads of records—important records, good records, and even bad records—that are often made very easily. They just go through nice and smoothly. But sometimes you have to really, *really* pedal very hard to make things happen in order to do the right thing. Basically, we were trying to do things we should have waited five years for, just to let the technology catch up to what we were trying to do. We were ahead of our time, mate! (laughs).

JUSTIN HAYWARD: "Nights in White Satin" has become a strange thing for me, ever since I heard Bettye LaVette's version of it [on her 2010 album *Interpretations: The British Rock Songbook*]. That sent me off in a spin. I burst into tears. It was like I heard it for the first time when I was 65 years old, you know? I wrote it when I was 19, so it was very bizarre. Bettye wrote to me and she called me "baby," like a '60s thing—"Oh, baby, I *love* that song!"—and it was just. . . (pauses) I hear "Nights in White Satin" differently now, and there's also something in the second verse that I *feel* differently now too. I still don't do it as good as she does, but no mind. I never really understood the song until I heard Bettye sing it.

JOHN LODGE: It would be brilliant if people who listen to *Days of Future Passed* 50 years from now could get the same satisfaction you get listening to classical music from composers like Tchaikovsky and Beethoven. The music has got to *transcend* you—and if you find the right classical music, it will also *transport* you somewhere else.

When we started recording *Days of Future Passed*, the technicians at Decca said to us, "Remember, you've got to live with this music 20 years from now." They didn't think of it in terms of 50 years from now, or even 1,000 years from now. The way we looked at it was, "You've got to stand by your music, and believe in it. Don't do it because you're aiming for a Top 20 hit—do it because you *believe* in it." We really *believed* in *Days of Future Passed*—and you can totally believe *me* when I say that! (laughs heartily)

05

SVS PRIME WIRELESS PRO SOUNDBASE

Sit and Listen Streaming

By Barb Gonzalez

RATING

PERFORMANCE ★★★★★

FEATURES ★★★★★

ERGONOMICS (DTS PLAY-FI APP) ★★★★½

VALUE ★★★★★

FOR ANYONE who has been waiting for streaming music to be a high-quality sit-and-listen experience, the SVS Prime Wireless Pro SoundBase streaming integrated amp fits the bill. It's the second generation S VS wireless smart integrated amplifier. Not only can it play just about any high-resolution audio file you send to it, but this 300-watt class D amplifier powers your speakers easily for outstanding sound. Connect it to standard speakers, and it becomes a DTS Play-Fi zone with reference sound (i.e. uncompressed) quality that can stream from numerous music services like Tidal, Deezer, Qobuz, Amazon Music, and others.

But this SVS does more than stream via Play-Fi. The Pro SoundBase can stream directly via WiFi. It can play audio using Apple AirPlay 2 and Google Chromecast. Moreover, the WiFi Critical Listening mode doesn't have the same bandwidth limitations and can handle up to 24 bit/ 192 kHz, for the highest resolution audio.

The Pro SoundBase also has several ports to connect to other hardware sources, instantly transforming them into Play-Fi streaming devices—and it does all of this for under $700.

FEATURES

The Prime Wireless Pro SoundBase is a small unit that can fit into the corner of a shelf. It has modern clean lines, so it won't stand out on top of your media center. Plug it into any wired speakers, download DTS Play-Fi, and it's as simple to get started as signing into your favorite music services.

It's easy to see what you are playing on the OLED display that shows the current song and music source. It's large enough read from across the room.

Connect to the Prime Wireless Pro SoundBase in just about any way available:

- Using Bluetooth with AAC and aptX that can handle FLAC files.
- Using line level input, optical, or HDMI ARC.
- Playing high-resolution music directly from services direct play via WiFi in Critical Listening Mode for the highest quality sound available.

With it the integrated amp's Digital to Analog Converter (DAC) can perform at the level of much higher priced standalone DACs, decoding at a rate up to 192KHz/24-bit for lossless bit-for-bit sound quality.

The Pro SoundBase can be controlled by AirPlay on iPhone, iPad, Spotify Connect, Google Chromecast, apps on a connected TV, using the Play-Fi app on devices or a desktop, the Pro SoundBase remote control, Alexa, Google, or Siri voice control, or via the buttons located on the front of the unit.

Despite all of the choices of music services and control options, SVS made it easy to play your favorite music. Add your selected songs from Amazon Music, Tidal, or others to create a unified Play-Fi playlist. Six preset buttons can be programmed so you can switch to music that suits your mood. Beyond the preset buttons, you can create unlimited Play-Fi Scenes with a simple tap when playing albums, playlists, artists or tracks.

UNBOXING AND FIRST IMPRESSIONS

The Prime Wireless Pro SoundBase easily fits in a corner of my media center. It arrived with SVS Prime Bookshelf speakers that dwarfed the Pro SoundBase and two SoundPath Ultra Speaker Cables. It was physically ready in just minutes.

After plugging into power, buttons on the back started the process of connecting to WiFi and pair ing to Bluetooth. There's no power button on the SoundBase. During setup, I had to reset the Pro SoundBase so the Play-Fi app on my iPhone would discover the unit. This required restarting my phone, unplugging the SoundBase, and then pressing the buttons again to reconnect and re-pair. It appeared in Play-Fi after the reset.

There is no SVS app for the SoundBase. The only menus to control the Pro SoundBase are those that control the lights on the display. All playback and preferences are done through the Play-Fi app. Perhaps it's less confusing as there is no equalizer or other controls. While I didn't need to micro-manage and tweak the sound, I was disappointed to have no control over the levels.

The next step was to choose which music sources I wanted to display by toggling on those I use and then signing into each one. Spotify appears on the music source page but uses Spotify Connect, which takes you out of the Play-Fi app and launches Spotify on the phone.

Adding the Pro SoundBase in the Alexa app was easy and enabled the Play-Fi skill. I changed the device's name as its original name was several numbers and a mouthful, and I wanted something that would be easy to say to Alexa. I changed the name to Pro SoundBase in both the Play-Fi and Alexa apps. It wouldn't control the unit. When I created a Play-Fi speaker zone called "Living Room," Alexa worked (in a DTS Play-Fi system, you can create different zones in your home, each playing music from different sources or servers). I could start and stop playing, switch to a different source, and play specific songs. There is a list of Alexa commands in the Pro SoundBase manual.

On the other hand, Google quickly added and controlled the SoundBase, but it only works with Google Chromecast music partners, and it has limitations to its sound quality.

The OLED display is a nice feature and easy to read with bright and big bold letters. The six little preset buttons are unobtrusive, but the SVS logo's blue light could be distracting in a dark room. Still, it's simple to change the lights or display by pressing the big left button until you like the brightness level, including turning off all lights.

PERFORMANCE

There are two aspects to consider when evaluating Prime Wireless Pro SoundBase's performance. There is the capability of the hardware which is responsible for the quality of the sound. And there's the streaming experience, namely the DTS Play-Fi app.

The hardware is where the Prime Wireless Pro SoundBase shines. Getting this kind of power and high-resolution sound from such a small, value-packed amp is remarkable. First, I wired it to the SVS Prime series full-range bookshelf speaker. SVS sent along its Soundpath Ultra Speaker Cable, providing a clear, interference-free, secure connection. Later, I connected it to a pair of Definitive Tower floor-standing speakers and subwoofer and finally tested it by plugging in Sennheiser IE900 wired in-ear monitors.

The amp's power was immediately noticeable simply because of its ability to drive the speakers. It excelled at playing dialogue via the HDMI ARC connection to my TCL TV. To hear dialog clearly on my 5-year-old Onkyo receiver (about 50 Watts per channel), I would have to crank up the volume to 57%. The Pro SoundBase consistently reproduced clear dialog at a 25 to 30% setting.

Turning up the music to half volume, I could hear the lyrics and tunes not only downstairs in my (albeit small) house, but upstairs as well. That never happened before.

Another small but happy surprise was when I was listening to Netflix movies with Spatial Audio. During *Murder Mystery 2,* there was a commotion, and I was taken aback that the audio filled the room and that the sound appeared to be coming from beside me. An SVS customer support person confirmed that they had the same experience.

But this Pro SoundBase is really about the music. There was a slight difference when listening to songs from the Play-Fi app in FLAC format at 16 bit / 44.1 and playing directly to the SoundBase, where the DAC can handle up to true ultra high-resolution formats of 192khz/24 bits. (Although there is no indication of the sound resolution once the music plays directly on the SoundBase.) Transferring to the Pro SoundBase was as easy as tapping an icon. It only took a few seconds for the music to switch.

Most of the music tested was played directly to the Pro SoundBase using Critical Listening mode for the best quality. On Tidal, John Klemmer's smooth jazz saxophone solos in *Hush* were open and precise, allowing all instruments to appear as they were in the studio.

Clapping hands in Rosalia's *Malamente* were so clear I could hear the snapping of palm flesh against each other. But the highs weren't as clear. Tambou-

At a Glance

- \+ Power to push most speakers with clarity at all sound levels.
- \+ Wi-Fi connection supports up to 192kHz/24-bit high-resolution audio.
- \+ Plays from a wide variety of streaming and physical music sources.
- \+ Clean design with easy-to-read front display.
- − The DTS Play-Fi app is clunky, buggy, and hard to use.
- − There is no equalizer to make sound adjustments.

Price: $699

SVS PRIME WIRELESS PRO SOUNDBASE

rines were a little shushy and muddied together. This may have been due to the speakers, so I connected to my older Definitive towers, which gave more of a clear tambourine sound. Plugging in my IE 900 Sennheiser in-ear monitors, the tambourines became crystal clear with the vibration of each little cymbal clashing.

Joni Mitchell's music takes on another dimension when played in high resolution, and the Pro SoundBase did not disappoint with either set of speakers. *Both Sides Now,* playing on Amazon Music Unlimited, was emotional as I could hear every sigh, poignant emphasis, and pause as Joni's voice reached into my chest and made me want to cry. The midtones were so powerful that I had to remind myself this was streaming.

Yes! *Roundabout* came alive with plucking guitar strings, resonance, richness, emotional voices, and clarity.

In my listening tests, the amplifier impressively showcased its fidelity, especially noticeable when playing bass-heavy Hip Hop tracks. Initially, I perceived what seemed like distortion in the lows, but further investigation revealed this was an intentional aspect of the recordings, not a flaw in the equipment. To further validate this, I connected a Definitive subwoofer with crossover and volume controls, carefully adjusting the settings. This only confirmed the amplifier's capability to accurately reproduce the textured and nuanced bass. A striking example was Bad Bunny's "Monaco" where the amplifier faithfully delivered the track's pumped-up bass, revealing the deliberate distortion embedded in the recording.

The six-button presets were a welcome feature with so many music sources available. Each preset can be programmed by pressing a button on the unit or the remote until the display indicates the button has been set. It can be programmed for an artist, a Pandora radio station, an album, your playlist, or random tracks in a music library. It's just as easy to reprogram the buttons. It was easy and fast to go from jazz to lively, cleaning music to sit-down-and-listen songs.

If you want more than six presets, the Play-Fi app allows you to create Scenes. While playing a song, press the icon with the finger on a box and name the scene. Each scene can be set to play at a specific volume, automatically play in Critical Listening mode, and more.

As good as the sound quality was, the streaming experience did not keep up. There is no proprietary app from SVS to help the situation. It is a DTS Play-Fi device and uses the Play-Fi app that's poorly designed and buggy. I would choose to play an album on Tidal and then want to get to a different track, but I couldn't find the list of songs in a playlist or on an album. Amazon Music required several clicks to navigate and often would timeout and spin the loading icon.

Trying to switch between sources with the Play-FI app didn't always work. I press the note in the upper left corner. It would bring up the sources, and I would pick another source, but the Pro SoundBase wouldn't change. I had a Scene to play Daft Punk in direct play; tapping the direct play didn't return the playback to Play-Fi control. I'd have to switch to another service and then go back to the album to continue playing.

The way around these issues was to play music through the TV. Tidal, Spotify, Amazon Music, and more music apps are available on many TVs. I chose to play from my Apple TV 4K, which is connected to my TV. There was a slight degradation of the sound quality that took some of the breathiness out of Joni Mitchell's vocals, but the convenience made up for it. Playing from the TV had the added benefit of viewing playlists, more straightforward navigation, more responsive playback, and the ability to view lyrics on the TV screen when available.

The good news is that SVS has outstanding reputation for excellent customer service. A live agent chat helped me work out the Alexa issues and some of the source switching issues I encountered. I could also set up an appointment to do a video call if I was really stuck.

Specs

DIMENSIONS: 3.23" (H) X 9.10" (W) X 8.81" (D)
AMPLIFIER SPECS: 300 watts RMS (150 watts x 2 into 4ohm) Class-D Power Amp; Rated Bandwidth: 10Hz-20kHz (±1 dB)
WIRELESS STREAMING OPTIONS: DTS Play-Fi: Lossless 192kHz/24-bit via Critical Listening Mode over WiFi; Apple Airplay 2 for iPhones and iOS devices; Chromecast for Android Phones and Devices: CD Quality; Bluetooth 5.0 with AAC and aptX; Spotify Connect
INPUT SPECS: HDMI audio input. Supports ARC and eARC; Left/Right RCA Input: Input Impedance: 20K; 3.5mm Aux Input: Input Impedance: 20K; Toslink Optical Input: S/PDIF receiver -sampling frequencies up to 96kHz; Bluetooth 5.0 with AAC and aptX; 6 front panel presets for one-touch access to music services and playlists; Ethernet; USB service port also for powering wireless accessories (See SoundPath Wireless Audio Adapter); 3.5mm IR control input
OUTPUT SPECS: Subwoofer Output: 2V MAX; Left/Right RCA Output: 2V MAX; Front 3.5mm headphone output: 1V@32Ωmax; Ethernet

CONCLUSION

Before the Prime Wireless Pro SoundBase, streaming was usually reserved for background music. It provides audiophile-quality music with the convenience of streaming from all your music apps. It's a powerful amp that creates separation, clear dialog, and an experience that makes you want to sit and listen.

If the DTS Play-Fi app becomes too annoying, consider giving up a little sound quality by playing through an app on the TV or other streaming device like an Apple TV 4K. Or be sure to create Scenes or program presets for any music you regularly like to play. If you have more patience, you can create a Play-Fi playlist or play through the music apps.

It's a great little unit; you can use it with your existing speakers, and you'll get sound quality far beyond its $700 price tag.

The Verdict

With the Prime Wireless Pro SoundBase, streaming music has become a sit-down-and-listen experience rather than just background music. It has excellent sound quality for a reasonable price. It's a great addition to include quality stereo music streaming, even if you already have a sound system.

MARANTZ AV10 15.4-CHANNEL AV PROCESSOR

AV Masterpiece

By Mark Henninger

RATING

PERFORMANCE ★★★★★

FEATURES ★★★★★

BUILD QUALITY ★★★★★

VALUE ★★★★½

THE AV PROCESSOR is the less well-known sibling of the AV receiver. The main difference being that processors don't have built-in amplification. This is a reasonable approach because as a rule amplifiers last a rather long time, and don't come obsoleted by things like new immersive sound formats or updates to HDMI standards. Going the AV separate route also lets you tailor the amplification to the speaker system whereas AV receivers are forced to split the difference between whatever speakers are connected to it and hope for the best.

Typically, there's a significant difference between an AV receiver rated at 100 watts per Channel, and an AV processor that is connected to a home theater amplifier rated at 100 watts per Channel. That difference is the "all channels driven" specification and with an AV receiver you might very well end up with only 30-40 watts per channel when all are driven simultaneously. If you use an AV processor with an amp rated at 100 Watts for all channels driven, you'll get full power even with the toughest and most demanding audio content.

With the AV10, Marantz has created a new flagship. The review system consisted of the AV10 and AMP10 combo (the AMP10 is a 16-channel amplifier that is the perfect accompaniment to the AV10).

FEATURES

For an overview of the features offered by the AV10, I suggest heading over to the Marantz website. Like cellphones, there's so much IP inside an AV processor, it is more of a computing device than anything.

The AV10 supports an array of multichannel surround formats, including DTS HD Master, DTS:X, DTS:X Pro, Dolby TrueHD, Dolby Atmos, Auro 3D, and IMAX Enhanced. It offers a maximum of 15.4 processing channels, offering a rich and immersive soundstage. The processor is equipped with Audyssey MultEQ XT32s with optional (paid) Dirac Live upgradability.

The AV10 includes HEOS Multi-room and Streaming, Bluetooth re-transmit for headphones, and compatibility with various voice assistants. For high-resolution audio enthusiasts, the AV10 supports various formats including FLAC, ALAC, WAV, and DSD Audio. It also works as a Roon player, a function I used for practically all of my music listening.

The HDMI specifications include 7 HDMI inputs, 2 main and 1 zone HDMI outputs, and supports 8K/60Hz and 4K/120Hz. Enhanced Audio Return Channel (eARC) and various HDR formats like Dolby Vision and HDR10+ are also supported. Gaming features like ALLM (Auto Low Latency Mode), Variable Refresh Rate, and Quick Frame Transport are included for minimal lag and smoother visuals.

In terms of hardware performance, the AV10's already been measured by the likes of Amir at Audio Science Review and Gene at Audioholics, so its world-class fidelity is on the record and verified. The upshot is, at this performance level what you are really hearing is transparency, the absence of distortion and noise. A peek under the hood reveals meticulous attention to detail.

Directional Bass is a newly

supported Audyssey feature. I've heard it work effectively in demos where you'll sense the bass energy coming from a general area that correlates to what's on (or off) screen. I can see situations where, done right, it adds to a sense of total immersion. You can switch between directional and regular bass at will.

This is a three-zone device, so if you don't use all the channels for a home theater system, you can effectively have it act as three separate audio processors and with HDMI dual-zone support you can route two separate video sources to the zones of your choice.

SETUP

I used the AV10 with three different speaker systems. The first was a 9.4.4 system featuring Arendal Sound 1961 speakers and subs, reviewed in the August/September 2023 issue. The intent being to (almost) max out the processor's channel count. The second system was a 5.4 Bowers & Wilkins speaker system. This had a pair of 703 S3 towers, a pair of 705 S3 bookshelf speakers, the HTM71 S2 center, and four Bowers & Wilkins DB3D subs—the speakers and subs are also reviewed in this issue. Here there is focus is on quality. And the third? A 5.2 system consisting of Pioneer XPRS powered PA speakers and subs, each connected directly to the AV10 via balanced XLR cables.

I do have one ergonomic complaint, which is that using the front panel and its monochrome display makes it tough to quickly adjust a setting. But with the on-screen display it's a lot easier to just use the TV. I relied on room correction to set levels and distances.

PERFORMANCE

Every second I spent listening to the AV10 was a pleasure, and a quick estimate reveals I've listened to the AV10 for over two million seconds. It can be difficult to pinpoint what makes a complex surround-sound system sound great but ultimately, it's the sum of various parts working together effectively.

It is no coincidence I was able to tune three totally different speaker systems to a level of performance where they sound transparent and totally at ease with any material. Each time I watched a movie, what came through is how well the speakers are tuned to create proper immersion—regardless of how many or what type of speakers I used.

With the Arendal Sound 1961 9.4.4 system, nine of the speakers were tower models, and the entire system is rated at 4 ohms. If you task an AVR with driving all of that, you'll likely leave up to 6 dB of output on the table compared to robust external amplification. Even *without* driving all channels simultaneously you'll start taxing the power supply before the amps themselves reach their output limit. The AMP10 is still power supply-limited, but much less than an AVR. It's a class D amplifier, so very little of the power it draws from its switch-mode power supply/toroidal transformer combo is wasted and found it a perfect match for the Arendal Sound 1961s.

Since the 1961 subs don't have XLR inputs, I used long RCA cables with no audible noise/hum. They also lack DSP tuning, so I relied entirely on the AV10 to handle bass EQ. The result? A system that amazed with its cohesiveness. I certainly credit the AV10 with making it all work. Without needing to deep dive into its many settings, the standard Audyssey routines and then manually choosing 80 Hz for a crossover to the subs worked out great. With the subs running in sealed mode, I saw measured extension right down to 10 Hz.

The Bowers & Wilkins 5.4-system, despite the much lower speaker and channel count, is the best-sounding rig I've reviewed in the past year and one of the top systems ever. Here, with only five speakers to power, the option exists to bridge the channels on the AMP10, or to biamp all five speakers. But it hardly matters how you wire it up unless you like pushing gear to its limits. I like gear I never need to max out; with only five speakers to power, the AMP10 had an easy time of it.

The combo of Bowers & Wilkins and Marantz is under the same corporate umbrella, Sound United. And based on aesthetics and price points, you can hardly find a better match for the Marantz system than the 700 S3 series speakers. I found the sense of immersion, from simple 5.1 audio, was still incredibly enveloping. How? Because the entire system delivered true high-fidelity audio; the entire soundfield was effectively holographic. The only thing missing was explicit overhead effects, which can always be added with more speakers, and I can only imagine what could be achieved if you maxed out the AV10's channel count with 700 S3 speakers. Still, movie after movie sounded seamless, never any issues with dialog clarity.

The four DB3D subs in the Bowers & Wilkins system were situated in the same spots that I put the Arendal Sound 1961 subwoofers—basically two up front and two behind the seating area. The correction curve Audyssey chose is nearly identical for the Bowers & Wilkins and for the Arendal Sound subwoofers. It indicates the room correction system truly is just correcting for the room (and succeeding).

The Bowers & Wilkins plus Marantz AV10/AMP10 system showed the value of spending on quality over quality. I did not expect the overall effect to be more aurally appealing than the Arendal Sound system, but many times I simply liked it better. As subjective a judgment as that is, it is how I feel.

And then there's the Pioneer PA system. No need for the AMP10, and they lean heavily on room correction and EQ to play nice in a home theater. This is not new territory for me, years ago on AVS Forum I started a thread about using Behringer B215XLs as home theater speakers. It was a popular choice for those who accept letting room correction fix the response curve. The result, you get amazing output and dynamics for comparatively little dough versus "home" speakers.

These Pioneer speakers are a lot nicer and more capable than those Behringers. And they accept a balanced XLR signal, so they work optimally with the AV10. And guess what? Holy crap! I'm listening to it as I type this. They are crisp, clear, smooth and dynamic. They image well and retain a proper soundstage when sitting off center. But there

Specs

MULTICHANNEL SURROUND SUPPORT: DTS HD Master, DTS:X, DTS:X Pro, Dolby TrueHD, Dolby Atmos, Auro 3D, IMAX Enhanced
PROCESSING CHANNELS: 15.4
NETWORK CAPABILITIES: HEOS Multi-room and streaming, Bluetooth re-transmit for headphones, compatibility with various voice assistants
STREAMING SERVICES: Support for Spotify, Pandora, SiriusXM, Amazon Music HD, TIDAL, and more
HDMI SPECIFICATIONS: 7 HDMI inputs, 2 main and 1 zone HDMI outputs, 8K/60Hz and 4K/120Hz support, Enhanced ARC, and various HDR formats including Dolby Vision and HDR10+
GAMING FEATURES: ALLM, Variable Refresh Rate, Quick Frame Transport
CONTROL AND INTEGRATION: IP, RS232, Web, and App Control, IR Flasher In, Marantz Remote Bus
AUDIO FORMATS: Gapless playback for FLAC, WAV, ALAC, DSD, and support for lossy formats like MP3, WMA, AAC
Phono Input

is one catch, the PA subs Pioneer shipped with them are big and loud but don't play all that deep. So, I left the four Bowers & Wilkins DB3D subs hooked up and used them with the Pioneers. While an effing expletive does the most justice to how awesome that combo worked out, what I will spell out is that it throbs and shakes and gets guttural while also dicing and slicing like an Iron Chef. It sounds like a nightclub!

With powered PA speakers, the entire system is free to play to its maximum potential. Pioneer claims 131 dB peak output. That's irrelevant to me aside from describing how much headroom there is: tons.

So, the cat is out of the bag. I will be reviewing the full Pioneer system in an upcoming issue. But I do want to touch on what happens if you use the Pioneer subs instead of the Bowers & Wilkins subs. This is a 5.2 system with three XPRS 122 speakers (L/C/R) and two XPRS 102 speakers as surrounds. The subs are the XPRS 1152S, a 15-inch ported sub designed for live music/PA duty so, its spec only goes down to 45 Hz (-6 dB) but promises up to 129 dB SPL output (to roughly match the speakers). On its own, it sounds bloated and overbearing and the measurements are miserable, these subs presume and demand the use of EQ to work at all (and really, I do not recommend PA subs for home theater use–even if you do go the PA speaker route, use them with home theater subs).

What happens if you let the AV10 tune the Pioneer sub system? I let Audyssey have a go at it. You get nicely tuned sound, with proper EQ and *very* powerful bass. But not bloated at all, the sub's sound is totally transformed! They play flat, right down to 45 Hz as the specs state. At which point the sub literally cuts everything off! Oh well. It's a brick wall, you get *nothing* below 45 Hz. Such is the engineering "cost" of building a high-output sub that does not self-destruct. So what benefit is there? Well, let's just say there's a ton of output in the range that live music uses. Get it? Live music, just like what these speakers were designed to play.

45 Hz extension no good for home theater, but dang I can get into a ton of trouble playing hip hop and reggae dub classics through this rig. It slams, whether it's Black Uhuru's *Dub Experience* or Mobb Deep's *The Infamous*. For something more modern in production, yet classic in sound, a thorough and deep listening to *Metallic Spheres in Colour* by The Orb and David Gilmour was as trippy and absorbing and interesting as with any other speaker system I have tried. It just emphasizes different qualities versus the other speakers, it's more direct and able to cleanly achieve output levels the other speaker systems could not touch. Also, the Pioneer subs make nice stands for the speakers!

So, the AV10 can tame even an unruly active PA speaker system, making it into a credible system for music, or blending them with home theater subs. And it can make top-tier speakers strut their stuff, so much so it can coax a 5.1-channel Bowers & Wilkins system into outperforming the already great Arendal Sound 9.4.4 1961 system. This ability to sort through the issues and deliver the best each system has to offer is a sign of a great processor, one that has a good chance of properly handling whatever an owner might throw at it.

If the purpose of a performance section is to find limitations and describe them, I'd be stuck complaining that the remote control. Nice as it is that the faceplate is a piece of metal, it still uses IR instead of Bluetooth, has tiny buttons that are hard to read or differentiate by touch, and it is not backlit.

Do you see where I am going with this? The AV10 is beyond what I need, but also is everything I desire in an AV processor. Sure, I know there's Trinnov and StormAudio out there, promising even more channels and even more sophisticated room correction. But that's the thing, with the AV10 I'm already done, with overkill. I don't see jumping from a four-figure MSRP into the world of five-figure price tag processors gaining me anything, I'd rather put the money into speakers and subs because the AV10 is already an endgame AV processor.

At a Glance

- \+ Balanced outputs for all channels
- \+ Supports four subwoofers
- \+ Audyssey MultEQ XT32 with Directional Bass
- \+ Dirac Live Bass Control
- \+ Easy on-screen setup
- − Antiquated front panel interface
- − Remote is hard to read, not backlit
- − Dirac features cost extra

Price: $7000

www.marantz.com

CONCLUSION

One word says it all: superlative. The AV10 is a dream machine. That's the main thing you need to know. And unless you are doing a billionaire-level home theater, it can probably handle whatever it is you need it to do, just like how for me, it handled three dramatically different speaker systems and made each of them into a compelling, cohesive listening experience. It proved its capability and adaptability in real life.

If you are willing and able to invest in separate amplification, the AV10 is at once incredibly powerful yet surprisingly accessible. It is a consumer product, but one with professional capability that can take your home theater or living room system to new heights of audio fidelity and AV content playback.

The Verdict

An engineering marvel from Marantz with just about everything you could ask for in an AV processor. Just add an amp and speakers for total immersion.

TOP PICKS OF THE YEAR 2023

By Mark Henninger

LOOKING BACK at 2023 and our Top Pick selections, what becomes clear is it was a great year for speakers. Whether passive or active, bookshelf or tower, we saw and heard high-performance designs that deliver the goods both sonically and aesthetically—as exemplified by the KEF LS60 which is far more than just a wireless speaker system, it points to a bright future for wireless active speaker systems. It was also a great year for subwoofers, with Klipsch stepping up to the plate and delivering a home run with its revamped Reference Premier subwoofer line.

On the video side, the Samsung S90C ups the maximum screen size of quantum-dot OLED to 77 inches and offers a true reference viewing experience in a sleek and stylish package. Need an even bigger screen? The TCL QM8 is available in sizes up to 98 inches and is a tremendous performer for the money, we tested the 85-inch version that costs less than a 77-inch OLED.

From the sophistication of the latest OLED TVs to the refined acoustics of modern speakers, 2023's Top Picks tracks the AV industry's evolution. The choices also make an effort to balance cost with quality, with a lot of today's gear, audio-visual technology excellence has become accessible to a broader audience. From the captivating clarity of cutting-edge OLED displays to the symphonic brilliance of state-of-the-art audio systems, these selections are more than just devices; they are gateways to immersive realms of entertainment.

4K OLED TV

Samsung QN77S90C

If you seek a TV that represents the state-of-the-art for image reproduction in a consumer display, the S90C is a quantum-dot OLED that delivers. This is an OLED that truly stands up even to bright daylight thanks to its high brightness. Its contrast is bolstered by the perfect blacks that is trademark OLED. Colors have an intensity that escapes most other TVs. And it's available in a 77-inch screen size that lets you appreciate the incredible detail it is capable of rendering.

This Samsung is a dream TV regardless of what you are into. If sports are what you love, it'll handle motion with great clarity and it'll shine bright on a Sunday at 1 PM. It has a very effective reflection-suppressing screen coating. But it's when you shut off the lights that the true superpowers of this TV are unleashed. It's well known that a combination of contrast, color and resolution is what it takes to make video imagery realistic and almost three-dimensional. This TV pulls that trick off to perfection, and when you play video games it is particularly pronounced how three-dimensional they can look. It even offers a 144 Hz peak refresh rate for gaming.

The TV runs on Tizen 7.0, Samsung's proprietary operating system for smart TVs. It has a removable stand and supports wall mounting with a VESA interface of 400 x 300 mm. However, the stand doesn't allow for height adjustment, swivel, or tilt.

With movies, viewers experience reference-quality playback that honors director's intent. The 77-inch S90C is also notable for its attractive, slim, and minimalist design. It rests on a pedestal not feet, so it will fit on a narrow stand. Wall mounted, it is nearly bezel-free and basically all screen. Built-in sound is limited by physics and the small size of the speakers. Nevertheless, the TV is equipped with various

audio features like Object Tracking Sound Lite, Q-Symphony 2.0, and support for Dolby Atmos. If you add a Q Symphony equipped Samsung soundbar, it works in unison with the TV to deliver a high-fidelity immersive sound experience.

About the only catch with the S90C is the cost relative to some 85-inch TVs. You can indeed buy an even bigger TV for less, one that performs at a very high level. But if the ultimate in cinematic picture quality is top priority, this OLED has what it takes to blow you away at an approachable price for such high performance. - $2,499.99, **samsung.com**

4K QLED TV

TCL 85QM8

The TCL 85QM8 makes a big impression in the large-screen TV market with its impressive 85-inch display, offering a compelling alternative to traditional home theater projectors. At a price point that's unexpectedly affordable, especially with online discounts, this TV brings the big-screen experience into the living room without breaking the bank. The allure of such a large display is undeniable.

One of the 85QM8's most notable features is its mini-LED backlighting, enhanced with quantum dots. The full-array local dimming, with its large number of zones, offers rich, deep blacks that rival those of more expensive TVs. The set's compatibility with various HDR formats, including HDR10 and Dolby Vision, further bolsters its visual performance, making it a versatile choice for different media types.

For gamers, the TCL 85QM8 is a dream, with a full suite of game-enhancing features like VRR, ALLM, and a high refresh rate.

The design and placement of buttons on the remote can be a bit challenging, navigating the Google TV platform may take some getting used to. These minor issues are easily overshadowed by the TV's overall quality and features. The set's calibration options are comprehensive, allowing users to fine-tune the picture to their liking, particularly beneficial for SDR content.

While the TCL 85QM8's built-in audio won't rival a dedicated surround sound system, it provides a satisfactory listening experience for everyday use. The extensive range of audio controls allows for customization, albeit with a bit of menu navigation.

The TCL 85QM8 is a remarkable offering in the premium TV market. Its combination of a massive screen, excellent picture quality, and a host of features, all at an attractive price point, make it a top choice for those looking to elevate their home theater experience. Its few ergonomic and interface shortcomings are minor compared to the immersive viewing experience it provides. MSRP is technically $2,799.99, but the street price is $1799.99 as of when this was written. - $2799.99, **tcl.com**

HOME THEATER PROJECTOR

Sony VPL-XW5000ES

Here we have a repeat winner. Why? Because nothing better has come along at its price and capability. As noted in 2022, this is the projector that brings native home theater 4K laser projection down to a reasonable price. Indeed, the one difference this year is the Sony sells for $5000 instead of $6000. It remains the most affordable home theater projector to offer native 4K resolution and a laser light source, and there's nothing else quite like. With 2000 ANSI lumens and high color accuracy, it'll light up a large screen quite nicely.

Of course, to keep the cost of the XW5000ES down Sony had to make some compromises. The lens is manual and is not as highly resolving as the lenses found on the step-up models: XW6000ES and XW7000ES. But, Sony employs the same X1 Ultimate for Projector processor in the XW5000ES and the same 0.61-inch 3-chip LCoS imagers. Its pricier siblings do offer higher performance, but it is merely incremental.

Sony provides an excellent full-size remote with direct access to many useful functions. The projector is near silent and easy to install thanks to its relatively small size and light weight. For picky videophiles with dedicated home theater spaces, the value proposition of this Sony is excellent. It's a projector that offers the truly cinematic-quality image quality theater enthusiasts demand. In his review, Mark Henninger notes, "the quality of the image it puts on screen cannot be matched for the money." - $4999.99, **sony.com**

GAMING MONITOR

Samsung OLED G95SC

A true cutting-edge piece of technology, the Samsung OLED G95SC is an ultra-wide monitor that is a gamer's dream but also an effective productivity tool. Although costly, with its 240 Hz quantum-dot OLED screen that's as wide as two regular monitors side-by-side, it is a truly state-of-the-art way to experience flight and driving simulators.

Dual QHD resolution (5120 x 1440 pixels) and a 240 Hz refresh rate are what make it a gamer's dream. When paired with a top-tier PC, the fluidity and clarity of motion it reproduces connect you with the game or simulator seamlessly. You feel connected to your actions because of the instant feedback. Moreover, it comes factory-calibrated for accuracy so if you switch to video editing, you can trust the colors it shows.

The G95SC offers a hassle-free setup process, with options to connect to a Windows PC, Mac, or phone using Samsung DeX. It's ideal for creative professionals, providing ample space for applications and supporting a seamless desktop experience. The monitor can also function as a "regular" 16:9 240 Hz monitor (with side letterbox), thus making it compatible with various gaming consoles and PCs.

The Samsung OLED G95SC is a luxury gaming monitor that blends high performance with a stunning design. It's particularly suited for hardcore gamers and creative professionals who value an ultra-wide perspective and high frame rates. It puts you right inside the game or simulation for a complete sense of immersion. - $1799.99, **samsung.com**

A/V RECEIVER

Denon AVR-X3800H

The Denon AVR-X3800H, priced at $1,699, presents a compelling blend of features and performance that hits the sweet spot for many home theater enthusiasts. As the most affordable model in Denon's range capable of supporting a full Dolby Atmos, DTS:X, and Auro-3D layout with its nine powered channels, the AVR-X3800H is a standout choice for those seeking top-tier audio quality without an extravagant price tag. This receiver demonstrates how modern design can deliver increasing levels of audio/video sophistication at stable price points, embodying the advancement of home theater technology over the past two decades.

This AV receiver doesn't just excel in audio performance; it's also packed with cutting-edge technology. It features HDMI 2.1 on all inputs and outputs, supporting 8K video capabilities and 4K upscaling. Its multi-subwoofer integration and room-correction features, powered by the top-level Audyssey processing (and the optional Dirac Live add-on), ensure a finely tuned audio experience tailored to the specifics of any room. The physical setup of the AVR-X3800H is straightforward, requiring minimal effort beyond the standard connections. Once set up, the Audyssey XT32 calibration routine fine-tunes the system, enhancing bass definition and midrange clarity, although users should be mindful of potentially exaggerated subwoofer levels.

From supporting various object-based surround modes and HDR formats to integrating seamlessly into the HEOS multi-room streaming ecosystem, it's a receiver designed for the modern, connected home. The AVR-X3800H offers a user-friendly experience. Its combination of powerful audio capabilities, advanced technology, and a user-friendly design, all at a reasonable price, make the Denon AVR-X3800H a true top choice for anyone looking to upgrade their home theater experience.- $1699, **denon.com**

INTEGRATED AMP (2-CHANNEL)

NAD C 3050 LE

The NAD C 3050 LE integrated amplifier stands out with its unique blend of vintage aesthetics and modern technology, offering a nod to the nostalgia of classic hi-fi. Its retro design, characterized by softly yellow-lit VU meters and gold-on-black graphics, pays homage to NAD's origins. However, beneath this vintage facade lies cutting-edge technology, including high-quality D/A conversion and the integration of NAD's BluOS streaming.

With Class D power and Dirac Live room correction (full-bandwidth available as a paid upgrade), the C 3050 LE is more than just a visual throwback. Once set up, the amplifier delivers an exceptional audio experience. Its bass is robust, never strained and the overall sound is warm and dynamic. This highly competent, transparent integrated is ideal for a wide range of musical genres. The incorporation of the BluOS app enhances the user experience by allowing adjustments like the crossover point for seamless integration with a subwoofer, further refining the sound quality.

While the C 3050 LE excels in many areas, like any gear it does have its limitations. The amplifier only offers one analog line input, which may be restrictive for users with multiple analog sources. Additionally, there's no pass-through for multichannel, slightly limiting its versatility in certain setups. However, the inclusion of various digital inputs, including eARC HDMI and Ethernet, along with a moving-magnet phono input, provides ample connectivity for most modern audio systems. NAD's C 3050 LE strikes an appealing balance between style and substance. It is an attractive choice for both audiophiles and those who appreciate the aesthetic of classic hi-fi. It is a fitting tribute to NAD's original designs, offering a delightful mix of the past and present in audio technology. - $1799, **nadelectronics.com**

AMPLIFIER

OSD Nero XA7180

The OSD Nero XA7180 stands out as a highly efficient and affordable solution for powering a seven-channel surround-sound AV or home theater system. Priced at just $850, it offers an impressive cost-to-performance ratio, delivering audiophile-quality sound at approximately one dollar per watt. This 7-channel amplifier is designed to handle the demanding task of amplification with transparency, adding no coloration to the audio it processes.

The XA7180's build quality is robust, featuring a solid construction that surpasses even some flagship AV receivers. Its toroidal power supply contributes to the weight but offers consistent performance. The amp is equipped with both RCA and XLR inputs and features individual status LEDs for each channel, adding to its professional appeal. Designed for shelf placement, it also sports an attractive front panel with brushed aluminum, fitting seamlessly into any audio setup.

Its ability to deliver clean, transparent, and powerful sound across seven channels makes it a versatile and valuable addition to any multichannel audio system. While it requires six inches of clearance when rack-mounted due to its passive ventilation system, this is a small compromise for its overall performance. The amplifier's ability to deliver more power to all channels simultaneously than typical AV receivers is a significant advantage, providing increased headroom and distributing heat generation more effectively. - $850, **osdaudio.com**

SOURCE COMPONENT

Apple TV 4K 3rd Generation

The Apple TV 4K 3rd Generation player continues to lead its category. It offers a significant upgrade over its predecessors, combining enhanced performance with a more affordable price tag. Priced at $129 for the 64GB version and $149 for the 128GB model, it remains the player to beat in the 4K streaming device market. The latest model is the same as last year and is particularly appealing to those already invested in the Apple ecosystem, as it seamlessly integrates with other Apple devices, providing a cohesive and user-friendly experience.

The device features the A15 Bionic chip with a passive thermal design, eliminating the need for a fan and resulting in a smaller and quieter unit. This upgrade leads to a 50 percent faster CPU and a 30 percent increase in GPU performance, offering a smoother and more responsive user experience. Additionally, the device supports a range of HDR formats, including the newly added HDR10+, enhancing the visual quality of content.

Apple TV 4K excels in its integration with other Apple products, particularly the iPhone. The setup process is streamlined, allowing users to quickly transfer settings, apps, and preferences from an older Apple TV mode. This feature is not only convenient but also time efficient. The device also offers audio and video calibration through

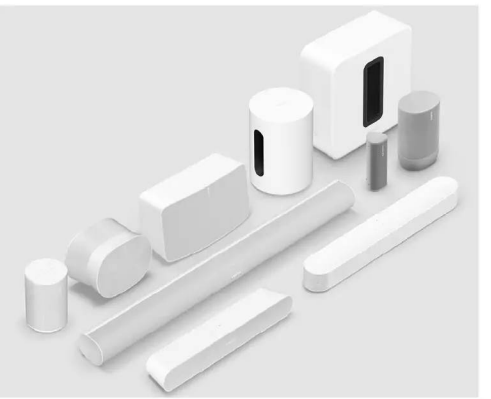
the iPhone, ensuring optimal sound and picture quality. Purchases and add-ons can be authenticated via Face ID or Touch ID on the iPhone, adding an extra layer of security and convenience. - $129 (64 GB) or $149 (128 GB), **apple.com**

SOUNDBAR

Sonos ARC with ERA 300 Speakers and Sonos Sub

The Sonos Era 300 and Arc 7.1.4 Atmos System present a formidable offering in the high-end home theater market. While its price point may be steep for some, the system justifies its cost with outstanding audio performance, particularly in delivering a full-dome Atmos movie experience and superb spatial audio for music. The system's ability to play loud without distortion is a testament to the company's focus on good sound.

The integration of the Sonos Arc soundbar with the Era 300 speakers provides a complete Dolby Atmos experience, previously unattainable in the Sonos lineup. The Arc soundbar, known for its excellent audiophile sonics and



compatibility with Sonos's wireless sub and rear surround options, is complemented by the Era 300's ability to deliver bass down to about 40 Hz and produce substantial power. This combination results in an immersive soundfield, achieving the coveted front-to-back Atmos dome and widening the overall soundstage, particularly with the inclusion of height effects.

The addition of the Era 300 speakers as rear surrounds significantly enhances the audio experience, filling in the gaps of the Atmos height bubble and broadening the soundstage. Adding a Sonos Sub Gen 3 to the system brings deeper, tighter and more defined bass, bringing extra impact to the overall sound.

The Sonos Era 300 and Arc 7.1.4 Atmos System is an investment in home audio, offering a level of sound quality and immersion that is hard to match. - $2,471, **sonos.com**

LOUDSPEAKERS

Bowers & Wilkins 703 S3

These speakers excel in delivering a holographic soundstage and imaging, combined with tight and articulate bass, making them a prime choice for audiophiles and serious music lovers. Their elegant design and easy assembly add to their allure, making them as much a statement piece as a high-fidelity audio device.

The 703 S3's distinctive 3-way, 4-driver design includes a 1" decoupled carbon dome tweeter, isolated in its compartment, the "Tweeter-on-Top" as Bowers & Wilkins calls it. The build quality of the 703 S3 is luxurious, with a visually appealing design that would enhance any room's aesthetics. The mocha wood grain finish looks great and the overall presentation of the drivers is both functional and stylish. In a 5.1 surround sound system, the 703 S3 towers shine as front channel speakers, providing an expansive and precise soundstage. Their ability to reproduce complex music and film soundtracks with clarity and detail is remarkable. The speakers maintain the scale of the soundstage with precision, faithfully reflecting the original mix and mastering of audio content. In a two-channel music setup, the 703 S3's stand on their own by delivering a refined performance. Their fidelity dealing with various music genres and films highlights their versatility, offering a listening experience that is both engrossing and emotionally resonant.

703 S3 speakers offer a level of performance and luxury that few other speakers can match. They stand as a testament to Bowers & Wilkins' excellence in audio engineering and design, making them a highly recommendable choice. - $5,999/pair, **bowerswilkins.com**

WIRELESS SPEAKERS

Klipsch The Nines

The Nines speakers embody a blend of heritage design and modern technology, delivering excellent treble clarity and warm, rich bass. Part of the Heritage Inspired Speaker line, these speakers are a testament to Klipsch's commitment to maintaining its historical sound signature, characterized by detailed highs and a warm tonal balance. The high-excursion 8" woofer and 1" titanium tweeter, along with the Klipsch-exclusive Tractrix horn, contribute to the speaker's impressive performance.

Here the horn serves more as a waveguide than as a means to make the tweeter more efficient, although it really does both. The result is more control over the highs.

The Nines feature a luxurious-looking MDF cabinet with a real-wood veneer, available in either black or walnut finishes. The build quality is robust, with attention to detail evident in every aspect, from the removable color-coordinated speaker grilles to the cork pads on the bottom. The top of the active speaker is adorned with an elegant aluminum panel, enhancing its aesthetic appeal. The speakers' classic design ensures they are not just great sounding but also visually pleasing.

The flexibility in placement is one of The Nines' strong suits, offering interchangeability between left and right channels and various input options. The speakers come with an array of cables, including a proprietary speaker connect cable and HDMI cable, providing ample connectivity options for different setups. The speakers also feature Bluetooth 5.0, supporting aptX, aptX HD, and AAC. However, they do not have built-in Wi-Fi, nor support AirPlay or Chromecast. The Klipsch Connect app offers an extended range of software functions, although the remote control provides only minimal tonal controls.

Klipsch The Nines stand as a high-quality investment for those seeking a blend of vintage aesthetics and modern sound technology. The speakers come with a small but easy-to-use remote control. Their price point is justified by their performance, build quality, and flexibility. These speakers bring a classic Klipsch sound signature into a contemporary setting, making them a valuable addition to any home audio setup. $1499, **klipsch.com**

PORTABLE SPEAKER

Sonos Move 2

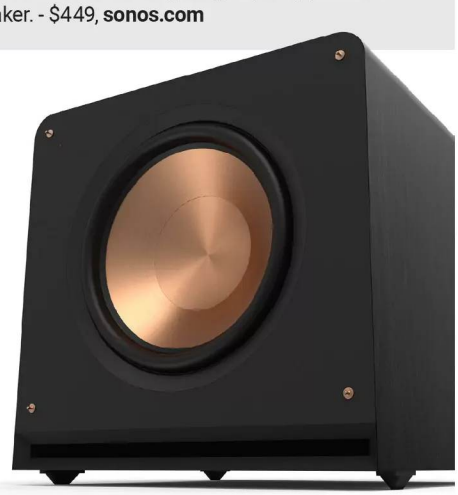
The Sonos Move 2 is a significant upgrade from its predecessor, offering a blend of enhanced features and superior sound quality. The speaker maintains the familiar aesthetics of the original Sonos Move, with the addition of a new olive shade to the existing black and white options. Its capacitive touch controls, compatibility with voice assistants like Sonos Voice Control and Amazon Alexa, and privacy control feature for microphone disengagement add to its thoughtful, user-friendly design.

One of the notable improvements in the Move 2 is its extended battery life, promising up to 24 hours of playback. This, along with the upgraded Wireless Charging Base and an IP56 rating for dust and water resistance, makes the Move 2 suitable for both indoor and outdoor use. The speaker supports Wi-Fi 6, Bluetooth 5.0, and has a new line-in capability via USB-C, offering versatile connectivity options. However, it lacks the ability to pair with a Sonos subwoofer and doesn't include a proprietary USB-C Line-In Adapter in the box, which may limit some usage scenarios.

The Move 2 impresses with its powerful bass and overall sound quality. The speaker adapts well to different environments, thanks to the Automatic Trueplay room tuning feature. Its sound remains consistent whether placed indoors or outdoors, making it a versatile choice for different listening scenarios. The Move 2's soundstage, while limited in its stereo effect, still manages to provide a satisfactory listening experience for a portable speaker. Its robust build, long battery life, and superior connectivity options make the Move 2 a compelling choice for those seeking a high-quality portable speaker. - $449, **sonos.com**

PORTED SUBWOOFER

Klipsch RP-1600SW



With a 16" driver and a front slot port, the subwoofer is designed to minimize port noise while delivering powerful bass. The subwoofer's appearance is deceiving; despite its large driver, it maintains a compact, muscular form. It weighs a substantial 111 pounds, indicating its solid build quality. The scratch-resistant ebony vinyl veneer and rounded corners give it an elegant look, complemented by the iconic gold Cerametallic driver, a Klipsch hallmark.

The RP-1600SW is equipped with a Class D amplifier rated at 800 watts RMS and 1600 watts peak, delivering an incredible amount of clean output and excellent dynamics. The subwoofer features RCA inputs but lacks XLR inputs and app control, focusing on delivering powerful performance through physical adjustments. The controls include dials for Gain and Low Pass, as well as Phase and Power toggles, allowing for basic yet effective customization. Despite its high power, the subwoofer remains efficient and does not generate excessive heat.

Klipsch's RP-1600SW is a mighty subwoofer that lives up to the brand's reputation for quality audio products. It comes with a full five-year warranty. - $1799, **klipsch.com**

SEALED SUBWOOFER

SVS 3000 In-Wall

This subwoofer takes a leap into the architectural speaker segment, presenting a solution that combines powerful bass with the invisibility of an in-wall design. The subwoofer features dual 9-inch drivers in a compact enclosure that fits between standard wall studs. Its design emphasizes acoustic inertness, even at extreme levels, achieved through solid aluminum front and rear baffles and internal bracing. The external Sledge STA-800D2C Amplifier is robust, providing 800 watts RMS and 2,500 watts peak power. It includes various connectivity options and supports the SVS Subwoofer Control Smartphone App for advanced control features.

The app allows users to tailor the subwoofer's performance with a three-band parametric EQ, offering detailed adjustments for optimal audio quality. Once installed, setting up the subwoofer involves connecting it to an AVR and fine-tuning using calibration tools like Audyssey. Installation of the SVS 3000 In-Wall Subwoofer is a commitment requiring a permanent location and cutting an opening in the wall.

Performance in music playback is notable, delivering quick, clean, and precise bass that complements different genres. With movie soundtracks, impactful bass adds to the immersion of scenes. While the subwoofer doesn't reach the ultra-low frequencies of larger models, its performance from 20 Hz upwards conveys the intensity of action-packed scenes.

The in-wall design frees up floor space while delivering impactful bass, making it an attractive option for homeowners looking to enhance their audio setup without compromising room aesthetics. The price reflects the subwoofer's quality and the advantages it offers, making it a worthwhile investment for those prioritizing both performance and interior design. - $1999.99, **svsound.com**

HEADPHONES (FULL SIZE)

Mark Levinson No. 5909

The Mark Levinson No. 5909 headphones represent the brand's foray into the high-end noise-cancelling Bluetooth headphone market. Known for their exceptional audio systems, these Mark Levinson headphones are tuned precisely to the Harman Curve and sport Hi-Res Audio certification. The 40 mm beryllium-coated drivers deliver a full-range sound, with a frequency response of 20Hz-20kHz in active mode and 10Hz-40kHz in passive mode.

While these headphones excel in sound quality and build, there are some minor ergonomic downsides. The voice confirmation for adjustments can be distracting, and the short On-Head detection setting may require manual playback resumption. However, these are small trade-offs compared to the overall performance and quality of the headphones. Each headphone comes with a hard-shell carrying case, various cables, and adapters, reflecting the overall quality and attention to detail of the product.

The Mark Levinson No. 5909 headphones stand out as top-tier noise-canceling headphones. Their reference-quality sound, exceptional ANC properties, and luxurious build make them a worthwhile investment for audiophiles seeking premium wireless headphones and deliver a listening experience that aligns with Mark Levinson's reputation for high-fidelity audio excellence. - $999, **marklevinson.com**

HEADPHONES (TRUE WIRELESS)

Sony WF-1000XM5

The Sony WF-1000XM5 are a refined successor to the highly acclaimed WF-1000XM4 True Wireless active noise-cancelling earbuds. They stand out for their smaller, lighter design, which significantly enhances comfort. Sony's focus on improving performance while reducing size has resulted in earbuds that provide twice the processing power of their predecessors and feature head tracking. They are perfect for Android users, offering a premium alternative to Apple's AirPods Pro.

Sony emphasizes comfort with the WF-1000XM5, designing them to be as light and unobtrusive as possible. This results in a fit that is both secure and non-fatiguing, outperforming other earbuds that may easily fall out. The new eartips improve comfort and offer a more stable fit, making these earbuds an ideal choice for active outdoor activities or busy urban environments.

The WF-1000XM5 delivers the "premium Sony sound" with ample bass and a balanced audio profile that includes detailed midrange and silky-smooth highs. The earbuds feature Sony's AI noise reduction technology and a bone conduction sensor, ensuring clear voice isolation during calls. Sony's advanced noise canceling capabilities rival those of the AirPods Pro, offering a comprehensive acoustic isolation that covers a wide frequency range. The accompanying Sony Headphones app provides customizable settings, including the innovative "Find Your Equalizer" feature for personalized sound profiles. - $249.99, **sony.com**

TOP VALUE

Monolith MTM-100 Speakers 2.1 System

The Monolith MTM-100 powered desktop speaker system delivers exceptional value and customizable sound at a combined price of $850, $500 for the speaker and $350 for the subwoofer. Despite lacking HDMI ARC for wired TV connections and having large cabinets that may be overwhelming for small desks, this speaker and subwoofer combo from Monoprice's Monolith series deliver an impressive performance.

Each speaker houses a 1.25-inch silk dome tweeter, two 4-inch paper cone drivers, and dual 5.25-inch passive radiators on the sides. The primary speaker includes all essential controls and connectivity options, such as USB Type-C, optical, and RCA inputs, a subwoofer output, and Bluetooth support. The secondary speaker is more minimalistic, featuring only binding posts for connection.

The MTM-100 system delivers rich, full sound with deep, tuneful bass and excellent midrange clarity. Its ability to resolve fine details and sound staging is notable, making it suitable for both music and movie soundtracks. The system's EQ controls allow for tailoring the sound to personal preferences or room acoustics, and the subwoofer's THX certification ensures low distortion and high-quality bass performance. The addition of the subwoofer elevates the overall audio experience with improved low-end extension and reduced distortion.

The MTM-100 speakers support aptX HD Bluetooth, allowing for a range of wireless connectivity options, including laptops, tablets, phones, and compatible gaming consoles. The primary speaker's multifunction knob and LED indicators provide intuitive control over the system, and the remote control offers additional convenience with smart memory tone wheel for treble and bass adjustment. For those prioritizing sound quality, this system is a solid investment in desktop audio. - $850 (speakers and subwoofer), **monoprice.com**

OVERALL TOP PICK OF THE YEAR

KEF LS60

The KEF LS60 Wireless Powered Loudspeakers represent a paradigm shift in the realm of high-fidelity audio. They are not just speakers but an acoustic revolution, delivering reference-grade sound quality and virtually full-range extension. Though they lack certain features like multichannel integration, a music-data display, and a phono input, the LS60 stands out as the ultimate streaming standalone system for the modern audiophile.

The LS60's design is a masterpiece of modern engineering, combining aesthetics with state-of-the-art technology. Its slim tower silhouette is adorned with a 2-way concentric driver and a quartet of dual-opposed woofers, presenting a visually striking and innovative design. While it lacks a grille, which might be a concern for some, its overall appearance is nothing short of spectacular.

At its core, the LS60 is a culmination of KEF's best technologies - the Uni-Q driver array enhanced by a metamaterial back-chamber for cleaner sound output and overlapping voice coils in the woofers for efficiency and reduced distortion. This speaker system is powered by three amplifiers per speaker, blending Class D and AB amplification for a balanced and powerful audio performance.

The LS60 offers a comprehensive range of inputs including coax, optical, HDMI/eARC, and analog, alongside advanced wireless technologies like Wi-Fi, Bluetooth, and Roon Ready functionality. The absence of physical controls is compensated for by the intuitive KEF Connect app, essential for setup and adjustment, delivering a seamless user experience.

The speakers' ability to fill the room with a stable and accurate soundstage, while maintaining clarity and detail at high volumes, is remarkable. The LS60's bass performance is particularly noteworthy, capable of producing subterranean frequencies that challenge even larger, dedicated subwoofers.

The KEF LS60 Wireless Powered Loudspeakers are more than just speakers; they are a testament to the evolution of high-fidelity sound. They embody a perfect blend of aesthetic elegance, technological innovation, and unparalleled sound quality. While they may not include every imaginable feature, their performance and simplicity make them a top choice for anyone seeking a premium, all-in-one audio solution. The LS60 not only meets but exceeds the expectations of what a modern high-end audio system can be, making them the top pick of the year for audiophiles and music enthusiasts alike. - $7,000, **kef.com**

SAMSUNG 77S90C QUANTUM DOT OLED 4K TV

Pinnacle Picture Performance

RATING

PERFORMANCE ★★★★★

FEATURES ★★★★★

ERGONOMICS ★★★★½

VALUE ★★★★★½

By Mark Henninger

IT IS a small miracle that you can buy a TV as good as the 77-inch Samsung S90C Quantum Dot OLED for $2500. But that's where we're at as 2024 begins. The price premium paid for early adoption has passed, current pricing makes it an exceptional value for those who prize high contrast, deep blacks, and intense colors. It's a matter of fact that the best time to buy a TV is between November and March, from Black Friday through the final sales before the new models ship.

This TV is an embarrassment of riches when it comes to capability. Daily, with this TV, I experience eye-popping moments, surpassing what I've grown accustomed to seeing from any display, at any price point. Even micro-LED panels costing a small fortune can't deliver the utterly seamless viewing experience of an OLED panel.

Before we get into this review, I want to tackle the topic of image retention and burn-in. If you are careless to the extreme, then you can potentially burn in your OLED TV. It is easily avoided by treating the TV with care. It's worth the effort for the picture quality that a Quantum Dot OLED offers. Where this TV separates itself from lesser TVs is with cinematic content and with video games like 4K current generation consoles and gaming PCs. That's what you must feed it to see what it can really do.

FEATURES

The S90C incorporates key features common to Samsung's premium 4K TV range. It includes the Quantum Neural Processor 4K handling tasks such as upscaling, reducing noise, processing motion, and optimizing HDR tone mapping.

Additionally, Samsung has redesigned the menu system of the S90C with the "Smart Hub." This centralizes critical settings and options. A distinct "Game Hub" is also part of this new design, focusing specifically on gaming needs. I particularly like how it enables easy and quick adjustments to settings like Picture Mode and Color Temperature, now achievable with just a few button presses.

The Filmmaker mode transforms the TV into a display that mirrors professional mastering screens, displaying colors that are both vivid and true-to-life, without any over-saturation. The Movie mode, while maintaining authenticity, adds a touch of vibrancy to the visuals. Additionally, the S90C excels in gaming performance, featuring a Game mode with a high refresh rate of up to 144 Hz, Variable Refresh Rate (VRR), and an impressively low input lag of under 5 milliseconds at 144 Hz.

The remote should be familiar by now. It's Samsung's standard design, which is pretty much the same layout as most modern remotes. It is able to control compatible connected and recognized devices for a seamless user experience.

The S90C shines in its ability to achieve high peak levels, essential for HDR content. This is evident in small specular highlights—think lightbulbs, the sun, and other bright "spots"—where it can reach over 1000 nits in peak brightness. This ensures content mastered to 1000 nits maximum will need little

SAMSUNG 77S90C QUANTUM DOT OLED 4K TV

or no tonemapping, meaning you are seeing true HDR. It fully covers the DCI/P3 color gamut and then some, ensuring a wide range of accurate colors for almost all HDR content. However, it's worth noting that despite its impressive brightness capabilities, it will not come close to matching the overall brightness levels of mini-LED lit FALD QLED TVs, a consideration for viewing in very bright environments.

The full feature set of the S90C is incredibly deep. It's also shared by other Samsung TVs. So, for the full scoop visit Samsung.com and read up on all the "smart" things this TV can do.

SETUP

OLED TVs are typically substantially lighter than equivalent-sized full-array local dimming TVs. That's certainly the case with this TV. It feels like handling a 65-inch screen. The pedestal base attaches in a matter of seconds. You just connect it to your Wi-Fi, or use HDMI to connect it to a source. Use a phone to do the initial setup and before you know it, you are enjoying some of the best TV picture quality that money can buy.

Out of personal preference, I choose the Cinema picture mode with color tone set to Warm 1. This works perfectly for everything but gaming. In the past, I might have chosen a brighter picture mode for daytime viewing on an OLED, but there was not a single moment over the course of the review where the S90C was not bright enough.

Cinema purists can go right to the Filmmaker mode setting, it is tuned for making movies honor director's intent when viewing in a dark room. Even 1 PM Sunday football games look bright and vibrant, the anti-reflective coating on this screen is extremely effective and nearly negates the mirror effect.

For gaming, I used Game mode with the Warm 1 color tone setting. It looks a lot like the Movie mode, no surprise since both minimize the processing performed on the signal, even though with games it's in the service of high frame rates as opposed to artistic verisimilitude.

If you are using this TV for a professional workflow, have it professionally calibrated. It makes an amazing PC monitor, although I'd speculate the 55-inch version is ideal for that application. If you do choose to calibrate, Samsung's menu system provides all the tools necessary to get this TV performing at a true reference level.

Once calibrated, meaningful measurements of accuracy register well under the threshold of human perception. It is a well-behaved TV and I have a hunch as to why. I'll throw in this anecdote: When I visited Technicolor earlier this year to see how OLEDs are used in modern production workflows, I overheard the resident color guru say something along the lines of quantum dot OLED being endgame display tech for mastering because it is true RGB pixels and therefore behaves in a linear fashion.

However, that is also why QD-OLED is a bit less resistant to burn-in versus the more common WRGB (white, red, green, blue) OLED that is the most common type. Regular OLED uses a white pixel that gives it extra brightness. Quantum Dot OLED uses just the RGB pixels to render pure white. But, the benefit here is that RGB QD-OLED can express any color at full brightness, a WRGB OLED cannot do that because once it starts depending on that white pixel, it is diluting the intensity of the color it is trying to achieve.

For sound, I used the TV on its own, but also with a Samsung HW-Q990C Dolby Atmos soundbar system. I also connected the TV directly to a Denon A1H AV receiver and used it in conjunction with a full-sized speaker system while leveraging eARC.

PERFORMANCE

This TV excelled in every application I tried, whether it's watching football in the day, basketball at night, streaming shows in 4K, or movies including Ultra HD Blu-ray. It consistently nailed the colors motion rendition, and it always delivered whatever amount of detail it could get out of the source material. And it is only the last point where there was ever any disappointment. And that's not the TV's fault, but when, for example, a sports broadcast is only in standard high definition, you could see the softness, especially due to the TV's 77-inch screen size, and in the back of your mind you're saying, "wow, the motion is fantastic, the colors are fantastic, I just wish it was 4K or at least better looking 1080p."

That's not meant as a criticism of the upscaling. Upscaling does what it can. It's just that once you see well-produced high dynamic range 4K playing on this TV, it sets the bar so high it's hard to climb back down. It's seductive. It's memorable. And you just wish that everything looked as good.

It's reasonable to say that numbers do tell the story about this TV's performance. It's bright, accurate, and has tremendous contrast. For gamers the lag is extremely low. The combination of wide color gamut and high contrast, 4K detail, extremely wide viewing angles (with no color tinting or loss of saturation or contrast), these things all come together and allow for the visibly superior overall picture quality of the S90C.

But I suspect most TV shoppers are not vested enough in raw numbers to use them as the ultimate arbiter of a purchase. If you are spending on a premium TV, it needs to blow you away.

What I'm trying to communicate is that this TV is performing at a level where it is beyond needing to base the conversation around the specifications. I'd rather discuss the effect of having its degree of capability and accuracy available. About what it's like to play my favorite video games on a TV that at times seems too intense, too bright. Which, if it's properly tuned HDR, is the intended effect! When I play Gran Turismo, when I'm driving into the sun and I squint because of the glare and reflections, that's realism. That's more simulator, less arcade game. You just "get it" that the TV makes the experience feel more real through the connectedness of the low lag and high frame rates plus the true-to-life lighting achieved by this bright and accurate quantum dot OLED.

If you put this TV in its Movie mode, with the color tone set to Warm 1, which is roughly equivalent to a 7,500K color temperature, the look of what's on screen is practically a dead ringer for what I see on my Galaxy S21 Ultra, my calibrated PC monitor, my iPhone Pro and also on my iPad Pro 12.9". It's commonly accepted that the iPad Pro has a very accurate screen (with over 10,000 mini-LEDs arranged into over 2,500 full-array local dimming zones). It's a thrill to see the TV mirror the tablet perfectly.

For those who are into photography or shooting video and have

Specs

TYPE: Quantum Dot OLED
COLOR: Titan Black (for both front and stand)
RESOLUTION: 3,840 x 2,160 (4K)
HDR (HIGH-DYNAMIC RANGE): Quantum HDR OLED
PICTURE PROCESSOR: Neural Quantum Processor 4K
AUDIO: Dolby Atmos, 2.1CH Speaker Type, 40W Sound Output
HDMI CONNECTIONS: 4, HDMI 2.1 with eARC
USB PORTS: 2
ETHERNET (LAN): Yes
DIMENSIONS (W X H X D, INCHES): Without Stand - 67.7 x 38.9 x 1.8, with Stand - 67.7 x 41.1 x 14.2

a Samsung Galaxy, a Google Pixel, an Apple iPhone, or some other phone that has a good camera and screen, you are missing out if you don't play it on a top-tier TV. You'll be amazed at how the 4K capture resolution translates, especially with outdoor daytime scenes that don't stress the small sensors. Going through a photo album while panning and zooming through photos takes full advantage of the TV's picture quality.

Similarly, GoPro and other action camera footage looks three-dimensional and almost hyperreal in its clarity. You can push a GoPro to 5.6 megapixels and downsample with a result that looks almost like CGI, it's so sharp from edge to edge. Same goes for DJI Mini 3 Pro drone footage, or any of DJI's recent drones. The video quality is astonishing. If you don't check it out on a quantum-dot OLED, you quite literally will not know what you are missing. If photography or video are your hobby, you will absolutely not find a better accessory for your hobby than this TV.

I promise that it makes photos pop with detail and depth that seems impossible. And while I'd love to see what an 8K QD-OLED TV might look like, I'd add that the benefits of the color and contrast of this TV, even though it is 4K, are convincingly superior to anything I've seen from an 8K TV and the extra pixels. Like with camera sensors, the quality of the pixels counts at least as much—if not more—than the quantity of the pixels.

What's happening here is the TV is matching the perceptual accuracy of my phone and of my tablet, and so without even having to calibrate, I have a closed-loop, perceptually color matched ecosystem. With color that's this accurate, I can trust it represents how the scene will be reproduced on other color accurate devices. Things were not always this way, but they are now, at least with this TV.

Instead of listing a bunch of movies and going through each one saying they looked incredible, I'll keep it simple. Movies I watched on this TV included

A Clockwork Orange and *Ronin* on UHD Blu-ray, as well as UHD streams of *Oppenheimer, Barbie, Spider-Man: Across the Spider-Verse, Avatar The Way of Water, Nope,* and *The Bad Guys*. I even snuck in a streaming screening of *Aliens* in UHD before wrapping this review. They all looked incredible, as good as I've seen, with a degree of "pop" that's truly next-level. The only complaint I have relates to screen size, I project on a 156" diagonal screen, so just about exactly twice the size of this TV. And the extra real estate makes an impact as well, even with a huge drop in contrast. Still, the picture quality of the S90C is endgame stuff for contrast, projectors are not.

A SOUND DECISION

TV sound and immersive audio has become an interesting topic now that TVs are so affordable. Pragmatically speaking, there has been no equivalent drop in audio system prices that accompanies dramatic increases in performance. That is all on the visual side of TVs. Fundamentally, this means that to get a cinematic, Hollywood-quality audio experience, you need to drop big bucks. In fact, you need to spend quite a bit more than the cost of this TV just to get started with standalone speakers, subwoofers and an AV receiver.

Even a premium soundbar system will wind up costing over a thousand bucks. But, it's worth mentioning that today's soundbars genuinely do deliver a refined immersive surround sound experience that is leaps and bounds better than what was available just a few years ago. So much so that the notion any AVR-based system can beat a soundbar is no longer a truism.

The catch, of course, is that a soundbar system is not expandable in the same way as purchasing separate, dedicated components. But the payoff is simplicity, it is aesthetics, and it is a surprisingly high level of performance given the size and price of the gear. This is especially true for Samsung, which has dedicated a lot of resources to developing its soundbars, and in particular making its premium Dolby Atmos soundbars into market-leading products that genuinely deliver a cinematic 3D immersive audio listening experience.

CONCLUSION

The S90C is a TV that truly surpasses what just about anybody will ever need from a TV at that screen size. It's just that good. I would go so far as to say that, considering its relatively reasonable price, it is the absolute top choice among TVs under an 80" screen size.

In this review, I've deliberately stayed away from getting deeply technical, because its performance can be verified on other sites that specialize in measurements. Instead, what I've attempted to convey is how this is a fully mature OLED product. It exceeds expectations for brightness and vividness.It fulfills user needs across a broad spectrum of usage scenarios. But it is worth noting a couple things as we conclude. The first is the fact that Samsung itself sells the S95C, a step-up model which also features a Quantum Dot OLED. And the fact Sony sells the A95L, another RGB quantum-dot OLED option.

At a Glance

- \+ High value for price
- \+ Superior picture quality
- \+ Works in bright settings
- \+ Low Lag and High Refresh Rate
- − Potential for image retention and burn-in
- − Lacks support for Dolby Vision
- − 77-inch is the largest size with QD-OLED

Price: $2499.99

www.samsung.com

Both of those models are available at a 77-inch screen size, both of them achieve a bit higher peak brightness that the S90C, and they are rightly positioned as flagship-level TVs. Sony doesn't have a step-down Quantum Dot OLED, but that's the thing: Samsung does with this model. And really, you give up very little as compared to those other two options with the S90C.

Which brings us to the question of value. If the S90C already does what pretty much any TV owner would ever need a TV to do, then it is genuinely of value at its current selling price of $2,500, as compared to the step-up Samsung, which is almost $4,000, and the Sony, which is retailing for approximately $5,000 as I'm writing this. That's effectively twice the price for a very similar panel, very similar performance, at the same screen size. And fundamentally, this is why I am so excited about the 77-inch Samsung S90C. It is an incredible value, because it is an absolute state-of-the-art flagship-class-performing TV.

The Verdict

When a TV's picture quality is the top priority over screen size, you won't do better than this 77-inch quantum-dot OLED from Samsung.

RATINGS
REFERENCE ★★★★★
EXCELLENT ★★★★½
GOOD ★★★½☆
FAIR ★★½☆☆
POOR ★½☆☆☆

OPPENHEIMER

Not long into Christopher Nolan's latest opus we begin to understand that, despite its three-hour runtime, *Oppenheimer* isn't bloated, it never drags, and in fact it dares the viewer to keep up with the many characters and plot developments. There's less of a scientific emphasis than you might expect, but what we need to comprehend is clear without ever dumbing down the subject matter. Instead, this is the epic story of an extraordinary genius, physicist J. Robert Oppenheimer (Cillian Murphy), tasked by the U.S. government to lead the team that would deliver the world's first atomic bomb. The Manhattan Project assembled many of the world's brightest minds in a makeshift town in the far reaches of the New Mexico desert, inevitably igniting clashes of styles and personalities. In a race against time to devise a weapon like none ever created, they overcame all manner of obstacles and faced unknown risks—could a chain reaction ensue and engulf the entire planet in a firestorm?—to complete their assignment and contribute to a decisive end of World War II.

Even after the great victory, however, many of the same people who hailed Oppenheimer as a hero turned against him for his vocal positions on the burgeoning nuclear arms race. The intent of this movie is to help us understand someone every bit as complicated as the physics he mastered, a man who stood at the center of one of the most important events in human history. And Nolan succeeds wonderfully with an engaging biography brought to life in bold storytelling with an exceptional—and very large—supporting cast.

Oppenheimer was shot by director of photography Hoyte Van Hoytema on a combination of 35mm and 65mm film, including many scenes captured in the IMAX process. The video master was born of a native 8K scan and finished at 4K, presented primarily at 2.2:1 with a screen-filling 16:9 for the large-format scenes. I've seen a lot of movies with shifting aspect ratios, but here I found the experience to be somewhat distracting. Select moments were captured in 65mm black-and-white, a creative challenge which actually required the creation of a new film stock.

Of course, detail is absolutely stunning, from facial imperfections in gargantuan close-ups down to the nap of J. Robert's suit and even the mysterious swirling specks in the Los Alamos air. The production utilized many of the original locations and the vistas are as breathtaking now as they have ever looked. Overall, the image is tremendously sharp, to the point that I felt that the grain was absent: I confirmed that it *is* definitely there, it's just extremely fine. Despite the capacious 100GB platter and complete lack of bonus content on Disc One, perhaps the expansive runtime and the high quality of the image were just too much for a single disc. To my eye, the casualty is the black levels, which too often appear crushed and lifeless. Similarly, the HDR10 grade is wholly adequate, but for a filmmaker who sets such notoriously lofty visual standards, why no Dolby Vision high dynamic range?

Be sure to reach minimum safe distance because the DTS-HD Master Audio 5.1 soundtrack can be a sonic assault, at times in artistic and unconventional ways.

Surround levels are generous, appreciable during instances of desert wind and thunder, immersive even without any overhead channels. Ludwig Göransson's essential musical score is perfectly balanced and the dialogue is thankfully clear throughout. Minute atmospherics are on display as well, as when a group is chanting inside a crowded room.

An HD Blu-ray and Movies Anywhere digital copy are provided. A third disc is where all the supplements reside, notably a seven-part "making of," a recent feature-length NBC documentary about the man and the bomb, and a rather scientific Q&A panel with Nolan and others. The thoughtful and talented writer/director typically shies away from commentary tracks, doing so again here in favor of extensive on-camera musings. ● CHRIS CHIARELLA

ULTRA HD 4K BLU-RAY
STUDIO: Universal Studios, 2023
ASPECT RATIO: 2.20:1/1.78:1
HDR FORMAT: HDR10
AUDIO FORMAT: DTS-HD Master Audio 5.1
LENGTH: 180 mins., R
DIRECTOR: Christopher Nolan
STARRING: Cillian Murphy, Emily Blunt, Matt Damon, Robert Downey Jr., Florence Pugh, Alden Ehrenreich, Scott Grimes, Jason Clarke

PICTURE ★★★★½
SOUND ★★★★½
EXTRAS ★★★½

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THE CREATOR

SET IN the year 2065, *The Creator* tells of a war between the human race and the forces of artificial intelligence that ensues after a nuclear device levels Los Angeles, killing millions. Joshua, a former special forces operative sent to track down AI's mysterious leader, is now a shell of his former self after suffering a tragic loss in the line of duty. Years later, the military recruits him to locate the elusive architect of advanced AI and a weapon he created, which has the power to end the war... and humankind. Joshua crosses into enemy-occupied territory only to discover the world-ending weapon he's been instructed to destroy is an AI in the form of a young child.

This is a wonderfully fresh take on the sci-fi/action genre. Focusing on Joshua and "Alphie," the post-apocalyptic story is as much drama as thriller, interweaving tonal shifts to play upon our heartstrings and fears. The characters are gradually stirred into this cinematic stew, which works well within the narrative's construct. The elements of action are effectively scattered throughout as the engaging plot unfolds, going from a simmer to a boil before reaching its inevitable conclusion.

This is a contemporary and stylized film that strives to recreate the look and feel of director Gareth Edwards' unique vision. Epic in both narrative and scope, that vision comes through in this Ultra HD rendering. The video, with its ultra-wide 2.76:1 aspect ratio and gritty aesthetic, reveals discerning levels of detail, definition, color and emboldened contrast that heighten its thematic impact. Dark elements mixed with bright highlights look simply terrific, revealing deep, interstitial blacks and well-delineated shadows. The film's many close-ups reveal oodles of detail, whereas wide-angle shots deliver multi-dimensional imagery that captures the essence of the story. High dynamic range plays an essential role in the presentation which, across the board, is simply excellent.

The Dolby Atmos surround mix is an active one, comprised of a combination of atmospherics, panning fills and discrete sounds. Nearfield sound placement in the bed channels is spot-on, providing an involving listening experience that emboldens the "being there" effect. Dialogue has refined vocal character and excellent room penetration. When the action ramps up, the track creates a resplendent blend of room traversing and well-balanced sound that elevated my enjoyment of the film.

The lone bonus feature is a "making of" documentary which is worth watching. An HD Blu-ray disc and a Movies Anywhere digital copy code are included.

The Creator is an entertaining film that's recommend on UHD Blu-ray. ● **RALPH POTTS**

ULTRA HD 4K BLU-RAY
STUDIO: Fox, 2023
ASPECT RATIO: 2.76:1
HDR FORMAT: HDR10
AUDIO FORMAT: Dolby Atmos with TrueHD 7.1 core
LENGTH: 133 mins. PG-13
DIRECTOR: Gareth Edwards
STARRING: John David Washington, Gemma Chan, Ken Watanabe, Allison Janney, Madeleine Yua Voyles

PICTURE	★★★★★
SOUND	★★★★★
EXTRAS	★★½

Fox

TITANIC

FROM ACCLAIMED filmmaker James Cameron, *Titanic* is an epic tale of forbidden love and courage set against the ill-fated maiden voyage of the R.M.S. Titanic, which carried over 1,500 people to their death in the ice cold waters of the North Atlantic in the early hours of April 15, 1912. When this film was released, the hoopla surrounding it was hard to miss. It seemed like everyone was talking about it, either to complain about its syrupy love romance and lengthy run time or to marvel at its superbly crafted story and game-changing special effects. Not at all what I expected, it truly is an experience like no other. Epic in scope, grandiose in execution, it is a trans-generational film that is haunting, tragic and engaging.

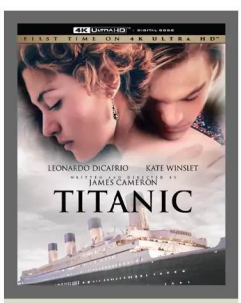
Presented in a 2.35:1 aspect ratio, this film's Ultra HD video rendering is a sight to behold. It's a period-based film that relies on stylized visuals that employ stark contrasts, vivid chromatic elements and lots of CGI. With an appreciable increase in detail, and richness of color, the image appears refined and vibrant. When brought together, the combination of color and sepia is magnificent. Blacks are rich, and contrast is strong, enhancing the film's bright and dark sequences with aplomb. The rendering of fine detail is, at times, breathtaking. Closeups are revealing of the subtle textures in facial features, hair and the beautiful costumes worn by the cast. Wide angle shots vary in terms of their depth but offer discernible degrees, and overall fidelity is excellent.

The implementation of HDR proves to be defining. This film relies on its ability to render light at differing stages, and the cinematography makes use of streaming/brilliant light which is sometimes combined with mid/low-lit backgrounds. Its application here is spot on, creating lifelike imagery with a near infinite sense of depth. Suffice it to say, this is an outstanding Ultra HD presentation.

The Dolby Atmos track is highlighted by robust dynamics and James Horner's superlative score. The music is spread across the soundstage, blending beautifully with the film's variety of audio effects to create a transparent, well-focused presentation. Dialogue is reproduced with exemplary clarity and room penetration. The soundstage opens up during the large-scale setpieces, delivering solid impact that underscores the disaster-based sequences.

The Ultra HD Blu-ray/digital release boasts five hours of new and legacy bonus content, including new interviews with James Cameron, Kate Winslet and producer Jon Landau.

Titanic is a filmmaking achievement that is not to be missed on Ultra HD Blu-ray. ● **RALPH POTTS**



ULTRA HD 4K BLU-RAY
STUDIO: Paramount, 1997
ASPECT RATIO: 2.35:1
HDR FORMAT: Dolby Vision, HDR10
AUDIO FORMAT: Dolby Atmos with TrueHD 7.1 core
LENGTH: 194 mins., PG-13
DIRECTOR: James Cameron
STARRING: Leonardo DiCaprio, Kate Winslett, Billy Zane, Kathy Bates, Frances Fisher, Gloria Stuart, Bill Paxton

PICTURE	★★★★★
SOUND	★★★★★
EXTRAS	★★★★★

Paramount

THE COLOR PURPLE

STEVEN SPIELBERG'S *The Color Purple* became one of the moviemaker's most remarkable successes, winning the National Board of Review's Best Picture Award and garnering eleven Academy Award nominations including Best Picture while earning him Best Director honors from the DGA. The unforgettable characters of Alice Walker's Pulitzer Prize-winning novel populate this lyrical cinematic adaptation. At the center is Celie, a Southern Black woman who gradually gains self-respect as she strives to educate herself and to find love, despite an abusive spouse and a society biased against her race and her sex.

I find this to be an engrossing and stirring drama. Spanning forty years, its narrative is epic in scope, tragic, and momentously uplifting. The subject matter is tough and its depiction in the movie is visceral and heart-wrenching. *The Color Purple* is a powerful and sometimes disturbing film that is filled with raw emotion and well-drawn characters that are supported by excellent direction and gripping performances by its entire ensemble cast.

The Ultra HD video presentation looks particularly good, featuring tonally balanced primary colors and well-defined secondary hues that appear vibrant. Flesh tones are lifelike and natural. During close-ups, the level of visible detail in facial features and in clothing is noteworthy. Wide angle shots vary in terms of visual depth, but fidelity is never in question. In general, resolution is excellent, offering clarity, detail, and dimension. Blacks are gradational and deep, and contrast and brightness are balanced well, which combine to enliven bright scenes while maintaining an appreciable level of delineation during darker segments. Grain is present and appears undisturbed. High dynamic range doesn't play a central role in the presentation, but its application is welcome and appropriate.

The soundtrack is almost entirely dialogue-driven, with the music being the other dominant element. Quincy Jones' score holds sway over the front soundstage, with excellent imaging and open expression. The mix provides clear and concise voice reproduction while the surrounds are used to broaden depth. Bass is held to the upper registers in support of the film's innate elements. Overall, I felt that the track sounded quite strong.

Bonus material includes a look at *The Color Purple: The Musical* and three production featurettes that provide insights into the casting, acting process, adapting the book to the screen, and discussions with the cast and crew. The "making of" is the best of the lot but all are interesting. A digital copy code is included.

The Color Purple is an absorbing and compelling film that looks terrific on Ultra HD Blu-ray. ● **RALPH POTTS**

ULTRA HD 4K BLU-RAY
STUDIO: Warner, 1985
ASPECT RATIO: 1.85:1
HDR FORMAT: HDR10
AUDIO FORMAT: DTS-HD Master Audio 5.1
LENGTH: 153 mins., PG-13
DIRECTOR: Steven Spielberg
STARRING: Whoopi Goldberg, Danny Glover, Oprah Winfrey, Adolph Caeser, Margaret Avery

PICTURE	★★★★½
SOUND	★★★★
EXTRAS	★★★½

Warner

Criterion

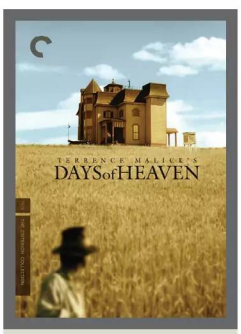
DAYS OF HEAVEN

WIDELY REGARDED as one of the most beautiful films ever photographed, writer/director Terrence Malick's second feature film, *Days of Heaven*, is a dramatically minimalist affair elevated by its often jaw-dropping visuals. The plot involves a long con by penniless lovers Bill and Abby who set their sights on a well-heeled farm owner, posing as brother and sister so that she can marry their way into a better life. Bill has a temper that gets him into trouble, and a precocious little sister who handles their nomadic life with remarkable ease. It's not a whole lot of story, frankly, in fact it sometimes feels so loose it can seem random (did 15-year-old actress Linda Manz even know that she was in a movie?) but it's held together by moments of suspicion and consequence. It helps that young Richard Gere and Sam Shepard are almost handsome beyond measure here, and Brooke Adams is rather easy on the eyes, too.

The Canadian scenery standing in for the Texas panhandle circa 1916 has never looked lovelier, either. Cinematographer Néstor Almendros (with a lot of help from Haskell Wexler) won his Academy Award for *Days of Heaven*, and Criterion's Malick-supervised/approved 4K restoration from the original camera negative takes full advantage of high dynamic range and wide color gamut. The extensive use of natural lighting and magic hour shooting imparts some magnificently subdued hues and generous shadows and silhouettes, set against blazing fire in one particularly memorable nighttime sequence. A strong yet low-key grain structure is maintained, and the 1.85:1 image is sublimely crisp when it wants to be, for the waving wheat and the sharp lines of the farmhouse. Interestingly, the included HD Blu-ray is framed at 1.78:1, in addition to being noticeably softer.

Presented in remastered DTS-HD Master Audio 5.1, the soundtrack has been upmixed from its original 4.1-channel source elements, which is not too shabby for a 1978 arthouse film. It was nominated for both best sound and best score Oscars as well, and the musical fidelity across the entire soundstage is outstanding, while the rears are called upon to host various instruments alongside ominous wind and thunder as the story dictates. The vintage farm equipment also displays an imposing LFE rumble.

Malick lets his crew do the talking on the supplied audio commentary and in some archival interviews, and Gere and Shepard talk about their experiences in their own legacy clips. The booklet features extensive insightful writing on the movie. For fans of great cinematography, Criterion's new disc is indeed *Heaven*.
● **CHRIS CHIARELLA**



ULTRA HD 4K BLU-RAY
STUDIO: Criterion Collection, 1978
ASPECT RATIO: 1.85:1
HDR FORMAT: Dolby Vision, HDR10
AUDIO FORMAT: DTS-HD Master Audio 5.1
LENGTH: 94 mins., PG
DIRECTOR: Terrence Malick
STARRING: Richard Gere, Brooke Adams, Sam Shepard, Linda Manz, Robert J. Wilke, Jackie Shultis

PICTURE	★★★★★
SOUND	★★★★½
EXTRAS	★★★

WEIRD: THE AL YANKOVIC STORY

OF COURSE when Weird Al makes his biopic, he'll take something preexisting and turn it into something uniquely his and rather funny. Put another way, the king of musical parody has gone and parodied the entire medium of celebrity biographies. *Weird* premiered as a Roku Channel streaming exclusive, the story of a boy with a dream an accordion making it big in comedy records by swapping his own lyrics into other people's songs. That's where any similarity to actual fact ends, as the plot veers unapologetically into blatant fabrication and a gleeful middle finger aimed at VH1 *Behind the Music* clichés. Those shifts might be the one weakness here, as the tone varies quite a bit, mostly absurd but trying a little of everything and often taking its time between the laughs. If you're a Weird Al fan though, it's definitely a must-watch.

Downconverted from a 6K capture to yield a true 4K release, *Weird* seems to have been shot a little soft, never giving us razor-sharp clarity but proffering more than adequate detail in both foregrounds and backgrounds. Black levels too are above average. Al's colorful Hawaiian shirts are ably reproduced, and a great many scenes possess a golden glow, the childhood sequences in particular, likely to impart a sense of nostalgia. The bulk of the movie is presented at a cinematic 2.39:1, but when Al begins appearing on TV, those faux clips are framed at 4:3, extending all the way to top and bottom of the screen and pillarboxed left and right, and I can't recall if I've ever seen this approach used before. Dolby Vision HDR brings a little extra zazz to the stage lighting when Al and his band perform in darkened arenas, and the Ultra HD image quality is a boon to spotting the many fun cameos sprinkled throughout.

Despite what the packaging states, both the 4K and the HD Blu-ray carry a Dolby Atmos track, which delivers clear dialogue and well-placed sound effects, and the soundstage opens up somewhat during the songs. (Worth noting, Al still provides the vocals for the film, while star Daniel Radcliffe mouths along and makes with some sweet gyrations.) The overall impact is fine, with minimal overhead engagement. A DTS-HD Master Audio 5.1 option is also included for those not partaking of 360-degree immersion.

Eric and Al reunite for the audio commentary—the only extra on 4K—and the HD Blu-ray adds 20+ minutes of deleted/extended/alternate scenes hosted by this same affable duo, alongside a few brief featurettes and interviews.

● CHRIS CHIARELLA

ULTRA HD 4K BLU-RAY
STUDIO: Shout! Studios, 2022
ASPECT RATIO: 2.39:1/1.33:1
AUDIO FORMAT: Dolby Atmos with TrueHD 7.1 core
LENGTH: 108 mins., TV-14
DIRECTOR: Eric Appel
STARRING: Daniel Radcliffe, Evan Rachel Wood, Rainn Wilson, Julianne Nicholson, Toby Huss, Al Yankovic

PICTURE	★★★★
SOUND	★★★½
EXTRAS	★★★

Shout! Studios

THE WARRIORS

FRAMED FOR killing the most admired and respected gang leader in New York City during a landmark announcement, *The Warriors* suddenly find themselves unarmed and on the run, with every cop eager to lock them up and every other gang member looking to fight them or kill them. It's one hell of a night for these guys, just trying to get back to their Coney Island home turf in one piece, but it won't be easy. Walter Hill's taut 1978 thriller has a dangerous energy all its own, with near-nonstop adrenaline punctuated by glimmers of social commentary.

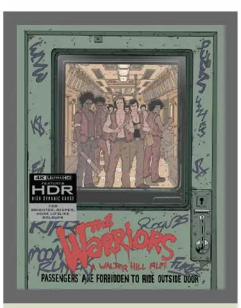
Unlike last issue's *Witness*, *Warriors*—like Arrow's recent *Barbarella* as well—is newly sourced from an original camera negative scan performed by Arrow. Both the theatrical and the 2005 "Alternate Version" here have been exclusively remastered and approved by Hill. Disc One's 1.85:1 aspect ratio also represents the first time the theatrical cut has been properly framed for home viewing.

The movie was relatively low-budget and shot on location in some of the ugliest parts of what was at the time one of America's dirtiest, nastiest cities and all of that gritty charm comes through in 4K. The tight grain structure gives way to video noise only occasionally. The story is set almost entirely at night and the blacks are generally deep and inky, while the palette is purposefully limited, with the gang colors among the only real standouts. The lighting choices are stylized, with sparse moments of bright highlights, as in the NYC subway tunnels.

The movie defaults to uncompressed original LPCM 1.0 mono with DTS-HD Master Audio stereo and Dolby Atmos at the ready. The Atmos track opens up the proceedings by imparting a touch of modern flair: cheering in the big crowd scenes, approaching police sirens and even an unseen helicopter overhead, with understated atmospheric grace notes throughout.

There's plenty of walking and talking going on, and the quality of the re-recorded dialogue is limited somewhat by the source elements. As a welcome bonus, Barry De Vorzon's musical score is available as an isolated DTS-HD Master Audio 2.0 track.

The theatrical cut includes a new expert audio commentary, new featurettes with Hill and others just for this set, plus archival supplements. Think of Disc Two's director's cut as an extra, albeit in 4K/5.1 and with a vintage intro, modified to include a classical Greek context and a deliberate comic book vibe in the scene transitions. Arrow's deluxe box also houses a 100-page companion book, four sheets of gang logo stickers and more. ● CHRIS CHIARELLA



ULTRA HD 4K BLU-RAY
STUDIO: Arrow, 1978
ASPECT RATIO: 1.85:1
HDR FORMAT: Dolby Vision, HDR10
AUDIO FORMAT: Dolby Atmos with TrueHD 7.1 core
LENGTH: 93 mins., R
DIRECTOR: Walter Hill
STARRING: Michael Beck, James Remar, Deborah Van Valkenburgh, Marcelino Sánchez, David Harris, Tom McKitterick

PICTURE	★★★★
SOUND	★★★★
EXTRAS	★★★★

Kino Lorber

FARGO

MINNESOTA NICE turns dark in this Academy Award-winning (Original Screenplay, the Coen Brothers; Best Actress, Frances McDormand) from Joel and Ethan Coen. William H. Macy plays bumbling car salesman Jerry Lundegaard who lands himself in debt embezzling money through his father-in-law's car dealership in a scheme using fake auto sales. To cover his tracks and make back the money, he hires two men (Steve Buscemi and Peter Stormare) to kidnap his wife for ransom. The plan quickly goes sideways, bodies start piling up, and a pregnant Sheriff from Fargo, North Dakota; Marge Gunderson (McDormand); joins the investigation when a Minnesota trooper turns up dead. The gritty cinematography and poetry-in-white by cinematographer Roger A. Deakins turn the setting into a character of its own in this visceral dark comedy, anchored by a nearly perfect performance by McDormand who nails the upper Midwest accent.

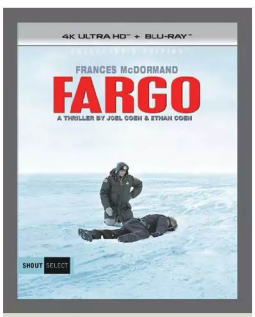
This Shout! Studios release of *Fargo* is a new 4K scan and restoration of the original camera negative, supervised by Mr. Deakins. Taken from

medium-to-high speed Eastman EXR 200T 5293 35mm film stock, the transfer is richly detailed, crisp, and has a densely packed grain structure. The color palette moves from the warm indoor scenes to the cool, desaturated snowy outdoors.

The tone of the white snow shifts from very cool, stark white to off-white and even, as the film progresses, dirty brown mingled in with the white. The 2160p (4K UHD) film is framed at 1.85:1 and Dolby Vision-encoded, spread across a 100GB platter. This Dolby Vison grading presents the colors well, with natural flesh tones, a gorgeous big blue sky, and vermillion reds against the white snow. Shadow details are nuanced and overall, we encounter no issues with noise or edge enhancement.

Fargo on UHD comes with a lossless DTS-HD Master Audio 5.1 mix that is subtle yet balanced and well-suited to dialogue-driven material. The voices come through clearly and the surround channels carry a fair amount of atmospherics and ambience.

Low end is good enough to underpin the action. On the 4K disc, only the excellent archival Deakins audio commentary is provided, but several previously released bonus features are on the included, remastered HD Blu-ray, among them an article from *American Cinematographer* and an on-camera interview with the Coen Brothers and Ms. McDormand. ● **BRANDON A. DUHAMEL**



ULTRA HD 4K BLU-RAY
STUDIO: Shout! Studios, 1996
ASPECT RATIO: 1.85:1
AUDIO FORMAT: DTS-HD Master Audio 5.1
LENGTH: 98 mins., R
DIRECTOR: Joel Coen, Ethan Coen
STARRING: Frances McDormand, William H. Macy, Steve Buscemi, Peter Stormare, Harve Presnell, Kristin Rudrüd, John Carroll Lynch

PICTURE	★★★★★
SOUND	★★★½
EXTRAS	★★★

Shout! Studios

THE FUGITIVE

AN ESTEEMED doctor on the run (Harrison Ford), a dogged U.S. marshal (Tommy Lee Jones) on his trail, a one-armed killer, and... F. Lee Bailey? These disparate elements all come together to form a delectable whole in Andrew Davis's thrilling crime drama, *The Fugitive*. Ford plays Dr. Richard Kimble, a surgeon who is convicted of murdering his wife. He goes on the run when the bus transporting him to prison crashes, causing a massive accident. He is determined to find the person he says is the real killer, a one-armed man who was in his house that fateful night. Meanwhile, Tommy Lee Jones is Samuel Gerard, the lawman leading the team to hunt down Kimble. Oh, and F. Lee Bailey? Well, he's not referenced in this film, but he was the lawyer involved in the original case of Sam Sheppard that inspired the 1963 TV series which in turn inspired this film. He's like the Kevin Bacon of the legal world.

The Fugitive has been restored in 4K from the original camera negative by Warner Bros. Discovery's Motion Picture Imaging (MPI) and overseen by director Davis. After the soft-looking opening scenes that may have you worried about the quality of this release, things turn around for good once we get to the sequence at the charity event. Spectacular! Presented on 4K Ultra HD in HEVC 2160p with a MaxLL of 3431 nits and MaxFaLL of 347 nits, the movie benefits from HDR10 grading that provides extended shadow details while also giving stable, deep blacks and a broad, vibrant color palette. One reference scene is Chapter 36 at the 1:49:00 mark when Ford steps off the el train: It is a symphony in orange lights with bright specular highlights and a vibrant pop of the skyline against the black night sky.

Bass-heads can rejoice over the Dolby Atmos remix because this track *booms*. At every expected moment, like the bus/train crash, we get rumbling, powerful low end. The mix is dynamic and atmospheric with clear dialogue, but there is disappointing underuse of overhead channels for discrete sounds. In the train derailment, for instance, there is only ambience overhead, and later during the helicopter chase we're only given ambience of the chopper blades from inside the helicopter.

The bonus features were all previously released, including the audio commentary by Davis and Jones. The most interesting featurette is *Derailed: Anatomy of a Train Wreck* that delves into the big train crash scene. A Movies Anywhere digital code is included.

● **BRANDON A. DUHAMEL**

ULTRA HD 4K BLU-RAY
STUDIO: Warner, 1993
ASPECT RATIO: 1.85:1
AUDIO FORMAT: Dolby Atmos with TrueHD 7.1 core
LENGTH: 130 mins., PG-13
DIRECTOR: Andrew Davis
STARRING: Harrison Ford, Tommy Lee Jones, Sela Ward, Julianne Moore, Jeroen Krabbé, Andreas Katsulas, Joe Pantoliano

PICTURE	★★★★½
SOUND	★★★★½
EXTRAS	★★★

Warner

FRANK ZAPPA

OVER-NITE SENSATION

SUPER DELUXE EDITION BOX SET

Frank Zappa was a master at creating musical Venn diagrams. What do I mean by that? Well, Zappa's compositional talents stretched well beyond the rock music idiom, so many of his releases would offer a keen intersection of doo-wop, classical orchestration, avant-jazz, progressive jams, country funk, and pure pop sensibilities (for starters). Sometimes he would even incorporate all his artistic powers into all 20-plus minutes of an album side's lone track.

As Zappa rolled into the 1970s, he initially leaned into more of an outré, jazz fusion approach on July 1972's *Waka/Jawaka* and then swung over to a big-band presentation for November 1972's *The Grand Wazoo* before harnessing then-modern pop/rock elements to fuel the breakthrough commercial appeal of September

1973's *Over-Nite Sensation*, one of the most accessible and popular albums of his career. To properly fete that album's 50th anniversary, Zappa Records/UMe have served up a 4CD/1BD Super Deluxe Edition box set, replete with 57 never-before-released tracks. Besides Bob Ludwig's 2012 remaster of the original album, the *ONS* box includes a score of unreleased masters, vault highlights, and additional outtakes from the original 1973 sessions mastered by John Polito on CD1 and CD2. Some of CD2 and all of CD3 and CD4 contain unreleased 1973 live recordings featuring the core *ONS* band playing a pair of shows—one at the Hollywood Palladium in Los Angeles, the other at Cobo Hall in Detroit. The 48-page saddle-stitched booklet features many unseen of-era photos and a pair of deeply informative essays by audiophile-centric journalist Mark Smotroff and Zappa's longtime Vaultmeister, Joe Travers.

The *Over-Nite Sensation* 4CD/1BD clamshell box measures a quite economical 5.1875 x 0.75 x 5.3125 inches (w/h/d), clearly following cube-shaped suit with other recent Zappa-related boxes like March 2022's *The Mothers 1971* 8CD collection and December 2022's 4CD/1BD *Waka/Wazoo* effort. Naturally, this makes the *Over-Nite Sensation* box much easier to shelve alongside the crux of your Zappa CD collection. Eagle eyes will note that, as per Zappaverse custom, near the top of the box's spine, the number 127 is nestled inside a squiggly word balloon—a direct nod to both the typeface and visual presentation of how the title of The Mothers of Invention's seminal debut *Freak Out!* appears on that gatefold double album's cover back in June 1966. That number, which perches directly above the signature Zappa mustache/goatee avatar, designates this particular version of *Over-Nite Sensation* as being the 127th official release in the Zappa canon. (Hands up—how many of you have *all* 127 of them in one format or another like I do?) For the vinyl-inclined amongst us, we have two options: 1) a 2LP 45rpm set on 180-gram black vinyl, and 2) a 3LP Deluxe Edition on splatter vinyl. If you love spinning Zappa's work on wax, you really can't go wrong with either/both of these multi-LP *ONS* offerings.

While there is indeed much great music to be found across all 4CDs in the box (I'll get to those highlights in a bit), I was most curious to hear the Dolby Atmos mix on Blu-ray that was done by Karma Auger and Erich Gobel. For further context, back in 1973, Zappa himself did a forward-thinking Quadraphonic mix of *ONS* that has since been unavailable until its reappearance on this new BD, and it serves as a telling spatial baseline for what Auger and Gobel did here in both Atmos and 5.1.

4CD/1BD

Label: Zappa Records/UMe

Audio Formats: 16-bit/44.1kHz PCM stereo (CD); 24-bit/48kHz Dolby Atmos and Dolby TrueHD 5.1, 24-bit/96kHz Quadraphonic and PCM stereo, 24-bit/192kHz PCM stereo (BD)

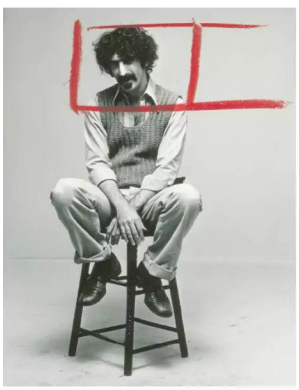
Number of Tracks: 60 (53 on 4CDs; 7 on 1BD)

Length: 5:27:34 (4:53:02 on 4CDs; 34:32 on 1BD)s

Producers: Ahmet Zappa, Joe Travers (super deluxe edition); Frank Zappa (original album)

Engineers: Barry Keene, Steve Desper (original album and live material); Terry Dunavan, Fred Borkgren (original album); Kerry McNabb, Craig Parker Adams (bonus material); John Polito (live material remix, audio restoration, and mastering); Frank Zappa (original album, bonus session masters,1973 Quad mix); Karma Auger, Erich Gobel (Dolby Atmos and 5.1 mixes for BD); Bob Ludwig (hi-res stereo remasters, 2012)

Performances ★★★★★
Sound ★★★★★



Over-Nite Sensation is among the ten most-played albums I've listened to in my lifetime, and I heard things in Atmos that I both found a whole new appreciation for and/or had never heard prior in the stereo mix. A few examples: the clever horn accents behind Frank's layered vocals in the height channels on the choruses to "Camarillo Brillo," the insistent gut-punch sub-channel kick drum and keyboard fills in "I'm the Slime," the side-channel clarity of FZ's blistering guitar solo on "Dirty Love," the equilibrium-challenging all-channel calliope swooshes of Ricky Lancelotti's unhinged lead vocals on "Fifty-Fifty," the proggy time-signature-bending blend of horns, keys, and ratchet in the heights and sides on "Zomby Woof," the gritty character of Tina Turner's instructional vocal responses now mixed to the forefront of the cat-and-mouse moments of "Dinah-Moe Humm," and Kin Vassy's haunting peak-and-valley-encompassing "yippy-ty-o-ty-ay" frontier vocals plumbing the depths of the full 360-degree field during the dramatic denouement to "Montana."

As for my favorite bonus tracks on the CDs, I can't get enough of the 2023 mix of the still-evolving 1973 version of "Inca Roads" on CD1, the quadified guitar lines in "Dirty Love" on CD2, the loping live ride into "Montana" from Hollywood on CD3, and the horn-laded live "Cosmik Debris" from Cobo Hall on CD4.

That's right, folks, don't touch that dial—without question, the *Over-Nite Sensation* Super Deluxe Edition is a truly sensational addition to the ever-burgeoning Zappa catalog. Until the next FZ canon-expander arrives, get yourself a cup of cawfee, give your foot a push, and kick back and enjoy all that the expanded *ONS* has to offer. ● MIKE METTLER

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ALICE COOPER: *BILLION DOLLAR BABIES*

Molotov Milk Bottles

UPON INCEPTION, Alice Cooper was conceived more as a group construct, not just a moniker for one person. The name itself was intended to encompass an all-for-one band concept, but it was also concurrently adopted by lead singer Vincent Furnier, who soon enough embodied the id and ego of Alice Cooper to such a degree that he transmogrified that persona into his fully becoming one and the same. Six-plus decades later, Alice Cooper is still going strong as the king of shock-glam metal to this very day—and his rabid fanbase wouldn't have it any other way.

How Vincent-as-Alice ultimately came to be directly informed the unapologetic, pull-no-punches raw power of the band's best-realized album, March 1973's *Billion Dollar Babies*. In essence, Cooper drew directly from the moral center of his clean-cut, pastoral 1950s upbringing. "I was just a normal kid," he admits. "I grew up in that sitcom world where everything was all-American, and all was okay. But there was also the side of me that saw the dark humor in everything—and the fact is, dark humor needsto be in rock & roll. That's what directed me towards being the villain. There was a moment when I realized rock needed a Moriarty—and I loved doing it. Sometimes, you'd go back and think, 'Why didn't I do this? Why didn't I do that?' But I found that I've now perfected this character into a sophisticated, arrogant villain who would never swear to the audience. That would be ungentlemanly."

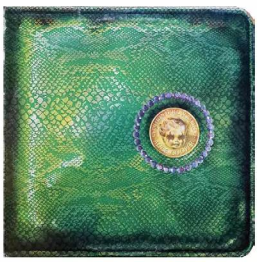
Once Alice Cooper began feeding his, and our, Frankenstein on Warner Bros. wax via hit albums like November 1971's *Killer* and June 1972's *School's Out*, the height of the band's chiller-thriller powers came with the aforementioned million-selling No. 1 LP, *Billion Dollar Babies*. Why did *Babies* click so well with the masses? "We spent nine hours rehearsing the music, and one hour on the theatrics," Cooper reveals. "Sitting there with [producer] Bob Ezrin and seeing him determine what the music needed to put it in a position for us to find out if it could play next to The Supremes and Simon & Garfunkel—that was the trick."

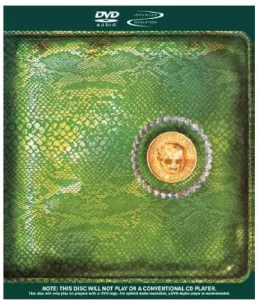
I obtained my original, albeit used, gatefold vinyl copy of *Babies* a few years after its initial release, one with each rounded corner already slightly frayed. The gradual ringwear on that snakeskin-green cover has only gotten worse over the ensuing years, resulting in the LP being relegated to a semi-permanent shelving position after Alice graciously signed the cover for me after one of our interview sessions back in 2014. (Yes, I have indeed golfed with Alice in one of his pro-am charity tournaments, but that's a story for another time.) I do have both Warner Bros./Rhino's 180-gram 2010 LP on black vinyl and the subsequent 2016 LP reissue on green/yellow/orange marble swirl vinyl, but I was hoping Rhino would've served up a 50th anniversary *Babies* reissue similar to what they did in June 2023 with the jointly expanded, and quite fine-sounding, 180-gram 3LP sets for both *Killer* and *School's Out*. Maybe they'll follow suit in 2024 with a simultaneous triple-vinyl reissue of *Babies* along with the album that followed it, November 1973's oft-misunderstood *Muscle of Love*.

Entering the digital age, I obtained the 1990 Warner Bros. Redbook CD for the usual obligatory/mandatory collecting purposes. I actually spent more time listening to the 2001 2CD Warner Bros./Rhino deluxe edition, chiefly for bonus material like the gritty 1973 live take on "I'm Eighteen" and the rockabilly-tinged outtake, "Coal Black Model T." Naturally, I gravitated even more towards the 24-bit/96kHz Dolby Digital 5.1 mix helmed by Ezrin, Gary Lux, and Ken Caillat on the 2001 Warner Archives/Rhino DVD-Audio. Favorite 5.1 moments include the rear-channel Mellotron fills from Bob Dolin on "Hello Hooray," the enveloping percussion throughout "Elected," and the super-clean acoustic guitar lines permeating "Generation Landslide."

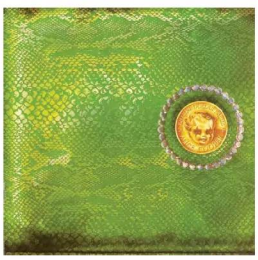
In June 2023, Warner Records/Rhino commenced a new reissue series with 24/192 updates of original 1970s quad mixes on Blu-ray under the company's "Quadio" designation, *Babies* included. The stacked-guitar opening to "Hello Hooray" spreads much wider and has more impact in quad than on the DVD-A, while the layered, outfront lead vocals and harmonies on "No More Mr. Nice Guy" also fare better in quad. Bottom line: Both the 4.0 and 5.1 *Babies* mixes have their own immersive rewards.

As we navigate yet another grueling yearlong election cycle, *Billion Dollar Babies* is as relevant as ever. And, hey, maybe we'll even get to bellow a welcoming, loud "Hello Hooray" together when we can all dream along to its hopefully inevitable Atmos mix. ● MIKE METTLER

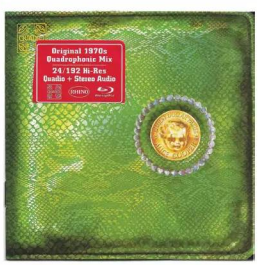

▼1973 Warner Bros. LP



▼2001 Warner Archives/Rhino DVD-audio


▼2001 Warner Bros./Rhino 2CD

▼2016 Warner Bros./Rhino LP



▼2023 Warner Records./Rhino Blu-Ray

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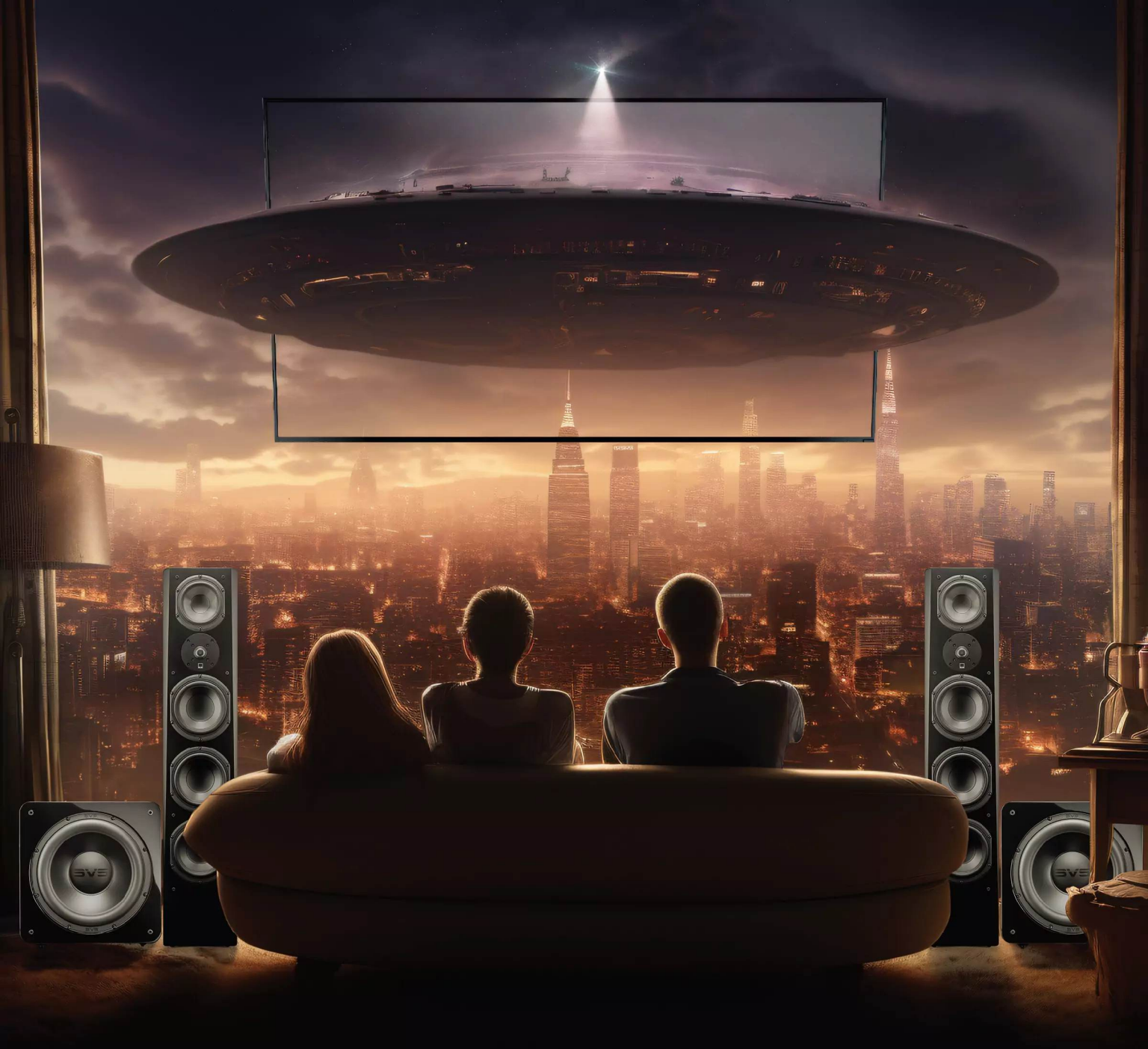

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